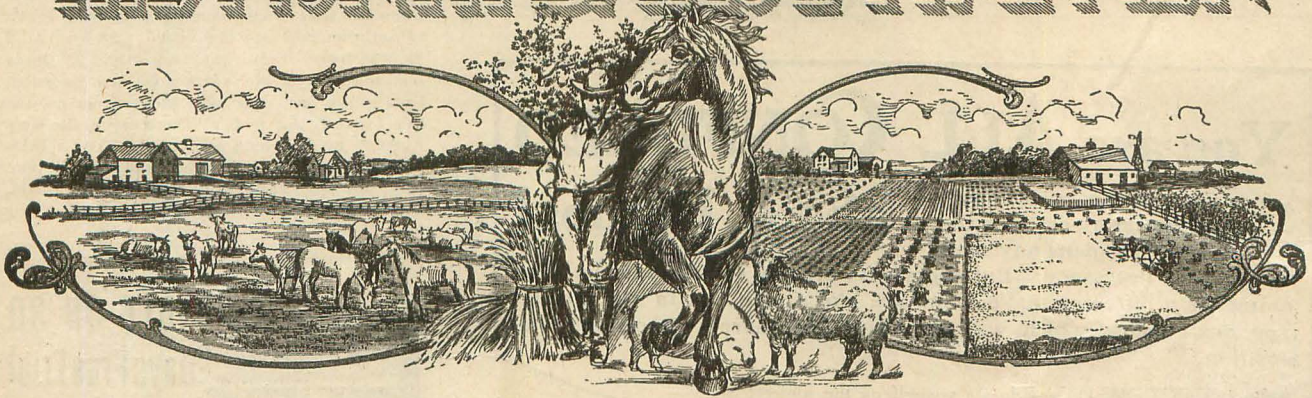


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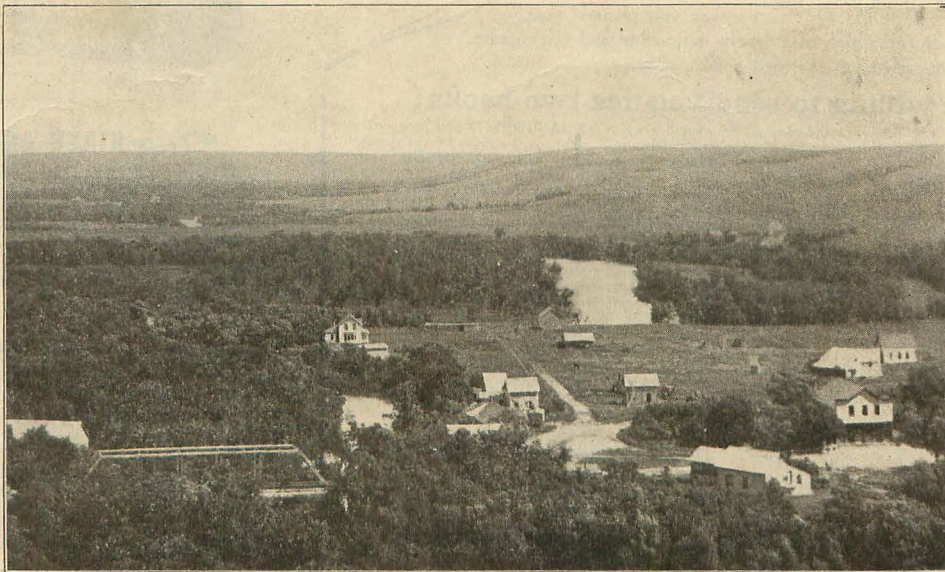
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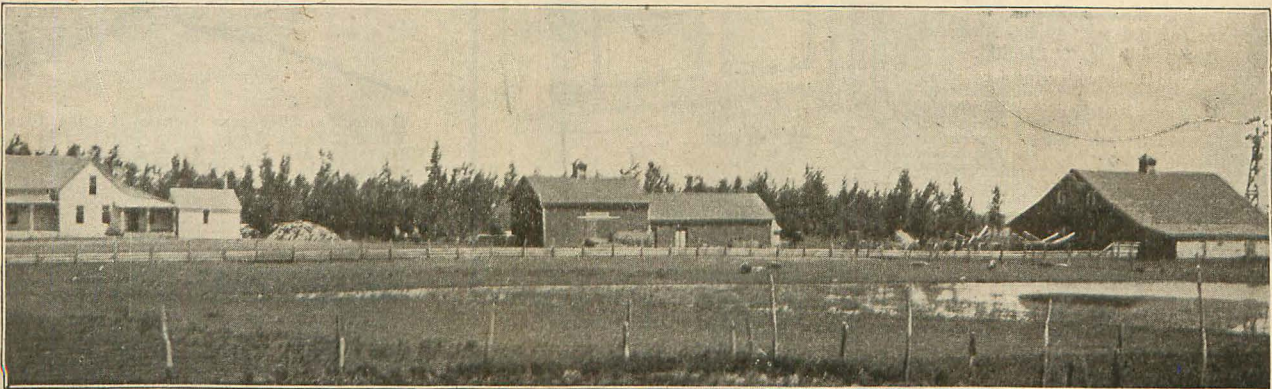
Vol. 10, No. 4  
LISBON, N. D.

OCTOBER 15, 1908

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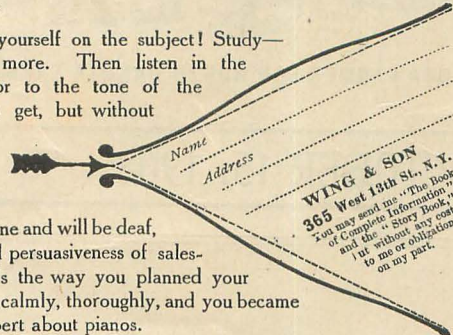
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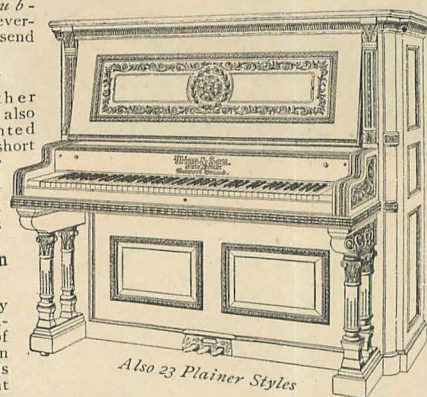
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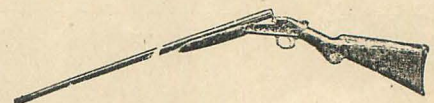
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# THE NORTH DAKOTA FARMER

Vol. 10, No. 4

LISBON and FARGO, N. D., OCTOBER 15, 1908

50 Cents a Year

## MY EUROPEAN TRIP

By PRES. J. H. WORST, N. D. A. C.

### HOW HOLLAND HANDLES LOAFERS THE VEENHUYZEN INSTITUTION

By J. H. Worst

Ninety-three years ago the Veenhuyzen Institution, or tramp colony was established, some eight miles from Aasen, Groningen province. The farm upon which this institution is located consists of about 8,000 acres of land of which 3400 are under cultivation; some 1500 acres are in timber, 200 acres are devoted to permanent pasture and the remainder is mostly peat land from which considerable peat is annually prepared for domestic use and for the market. As rapidly as the peat is removed the land is either planted with trees or used for agricultural purposes. On the whole the land comprising this farm is not the most valuable, being mostly reclaimed peat land. I should say in passing that the peat or heather district of which this farm is a part is of considerable area and is overlaid with an average of about 7 feet of peat which is used for domestic fuel, steam making, etc. After the peat is removed, the land is slowly brought under cultivation, but requires liberal applications of commercial fertilizers before it becomes sufficiently productive to be of much profit. Potatoes usually do well on these peat lands but grass, hay and grain do not grow luxuriantly until the land has been cultivated for a number of years.

#### The Buildings and Barracks

Two principal sets of buildings are maintained on this farm—some distance apart—where the officials are provided with quarters and the inmates with barracks and from which the several industrial and agricultural operations are directed. These groups of buildings are well planned and located in the midst of shade trees and shrubbery and flower beds that would do credit to the skill of any landscape gardener.

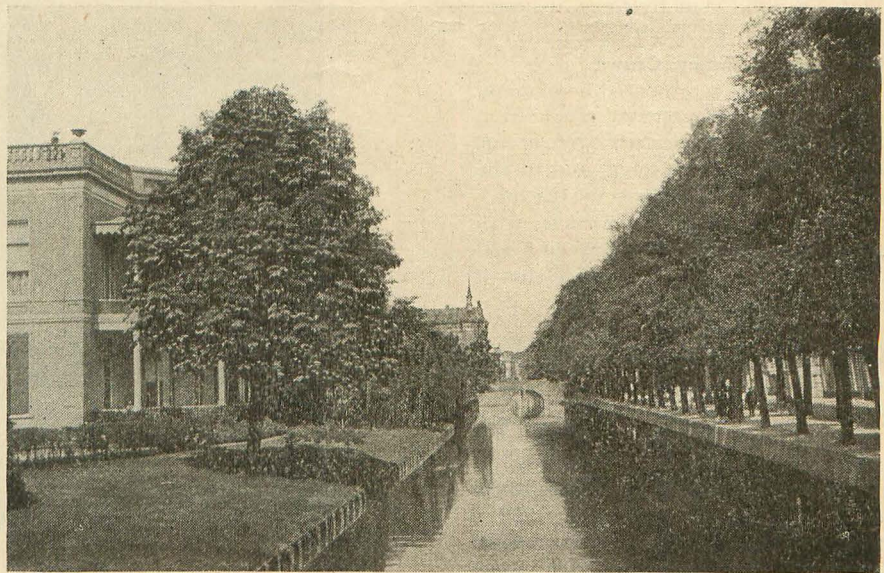
When we visited the institution last summer there were 2800 inmates cared for on the farm. But a few years ago

there were as many as 3900 on the farm, but the number became reduced mainly from the fact that the inmates are not sentenced for such long periods as formerly; the average sentence now being but little more than two years.

#### Character of Inmates

The class of men sentenced to this colony corresponds very nearly with our American tramp. When a man, on account of drink, laziness or any other sort

some other microbe of profligacy drove him into the good-for-nothing class and made of him a vagrant or a loafer. Tailors, bakers, coopers, mat-weavers, shoemakers, etc., all find employment here, and if industrious they receive, in addition to their keep, from about two to six cents per day; two-thirds of which they are permitted to spend for tobacco and other luxuries, while one-third is reserved until they are discharged. From this reserve fund a ticket is purchased from Aasen, the nearest village, to the inmate's former home, or to the place he may designate, and the remainder is sent to the mayor of the village to which the discharged inmate de-



A Dutch Village

of degeneracy, short of crime, fails to support himself or his family he is sentenced to the Veenhuyzen, or tramp colony for from two to three years. Here he is compelled to work and earn his keeping. As far as possible the inmates are given the same character of work they were engaged in before being sentenced. Farm laborers work on the farm, carpenters do the building and repairing, so far as such labor is needed, and those who followed the textile or iron industry are given work of that kind at the institution. In short, practically every man can engage here in the trade he followed before strong drink or

sires to go, the latter with instructions to dole it out to him in such manner as will accomplish the best purpose.

An effort is usually made by certain charitable societies to find employment for discharged inmates and to surround them with influences calculated to restore them to their former social relations and place them again upon a self-supporting basis. Many backslide, however, and are returned usually for a longer period. The number that are reclaimed is fairly encouraging, we were informed, and the system may be pronounced a success. Society is benefited every time a loafer is reclaimed,



friends of the institution assert, while those in the colony are compelled to earn their maintenance and society is rid of them at least while they are there.

#### The Theory

The theory is a simple one. If a man becomes a loafer or a tramp whatever the cause may have been, he is sentenced by the court to live at least two years in the Veenhuyzen institution where he must earn his salt. He is then discharged and given an opportunity to earn his living in the usual way, which is no more difficult than at the loafers' colony but naturally much more dignified. If he relapses into a loafer again and becomes a charge upon his family or friends, he is returned to the colony and given a second and usually a larger dose of reformation. He is not considered a criminal nor is he treated as one; he is simply a "good-for-nothing" and placed when he cannot burden society—where he must earn his daily bread. He is not so strictly guarded as criminals would be, and should one even escape and go to work as a self-respecting man should, the chances are that he would not be molested; the dominant motive being to persuade or compel him to "earn his bread by the sweat of his face"—peaceably, if possible, but by force, if necessary.

#### A Motley Crowd

All classes are represented here, many of them—at least some of them from very good families, men who were at one time prominent in business and in the professions, but who for some reason—usually drink—became worthless, with strong symptoms of vagrancy, and hence their sentence to this colony of good-for-nothings.

#### A Remedy for Tramps

Instead of allowing men to tramp from east to west and back again, in endless procession—a terror to timid women and children and a nuisance generally, as we permit professional tramps to do in this free country, it would seem better for society and certainly better for them, to be given about two years of enforced industry where they might learn the fine art of earning a living just as other people do. If they could earn more than what their keeping amounts to, each one should of course be credited with his surplus earnings and given a taste, when reformed and discharged, of what it is to be a capitalist—even if a small capitalist. The industrial habit might stick, certainly with a few, and the others would at least have a comfortable home for a period of time with the consciousness of having earned it. Holland has thus solved the loafer habit pretty effectively by compelling loafers to be self-supporting. Some such industrial system might well be provided to solve the tramp problem in this country. They want to be shown how

to do it—forcibly if necessary. Of course it is extremely questionable whether any system of this kind would work with tramps in America as it works with loafers in a compact little country like Holland. These observations are only suggestive of some possible remedy for our professional tramps. They are not criminals until they commit some crime, yet the very life they lead naturally breeds crime and is apt to end in a criminal career, sooner or later. That some remedy should be applied cannot be questioned, and as tramps are not necessarily criminals, the remedy should be in the nature of compulsory labor that would as nearly as possible resemble earning a livelihood.

stated, is given work at his ordinary trade which makes the colony an industrial center, the products of the several trades finding their way into the ordinary markets, after supplying the demands of the colony. To supply the tables with meat and vegetables and to give employment to men accustomed to agricultural pursuits—for even this class is represented here—sufficient grain, vegetables, hay, meat, etc., are produced on the farm to feed the men and the work-stock. To supply the butter and cheese 260 dairy cows are kept; about 100 head of cattle are raised and killed annually and from 50 to 60 hogs and from 200 to 400 sheep are slaughtered each year to supply the tables with



The Heather Lands.

#### The Men are Carefully Guarded

To prevent immoral practices the men at this institution are locked into bed cages at night, each by himself. The inmate's work is regular, his food plain but substantial and his clothing and wooden shoes compare favorably with those of the average Holland peasant. From all outward appearances the inmates appeared contented and went about their work as cheerfully as tho they were merely hired men.

As noted elsewhere, the purpose of the colony is to reform tramps and loafers by making them, at least for a period of years, self-supporting. To do this in the most natural way each man, as

meat—all the product of the farm. The care of this livestock, the conversion of the milk into butter and cheese and the making of hay and raising and threshing of grain—in fact all the farm work is performed by these inmates, under the direction of competent but humane overseers. The work is so adjusted that the products of the farm and of the different trades supply all local needs, with sufficient surplus to recompense the more industrious men somewhat for luxuries, with possibly a small sum of money to begin life anew when discharged. Should any shortage or deficiency occur the provincial government makes up the deficit.



### Experimental Features

The farm here described is to some extent an agricultural experiment as well as a training school for loafers. After the peat is removed from the heather land the ash colored sand beneath is lacking in certain plant food elements, notably of phosphoric acid and potash. As the heather lands are of considerable extent and farming land is in great demand the best method of reclaiming it is still a matter of experiment. It also compels the colony to support itself under rather adverse conditions—on the poorest quality of soil. Commercial fertilizers and barnyard manures gradually increase its productive qualities, however, and the older portions of the farm now yield fair crops. In time the entire farm doubtless will become highly productive.



A Dutch Maiden.

It may be said in this connection that Hollanders go to great expense and perform prodigious feats of labor to reclaim otherwise worthless lands. On the West shore of the island Overflaakke I saw small fields of from two to four acres each where the sand had been removed to the depth of from two to six feet to get down to the sea clay which contains from 16 to 19 per cent of potash and which is remarkably productive when planted with garden truck, berries and fruit trees. The sand was wheeled off the land and banked up all around the fields, in wide ridges, which were carried up from twelve to fifteen feet high. To prevent the sand from spreading or washing down, the sides of the ridges were veneered with sod cut from the wire grass flats that abound near the sea. These ridges of sand were then planted

thick with trees and shrubbery, which not only protect the fruit and vegetables from the raw winds of the North Sea, but before the sod decomposes and liberates the sand the roots of the trees and bushes are so established that they hold the ridges of sand in permanent position. The little fields thus reclaimed by removing the surface sand and which are so thoroly protected from the sea winds presented a wealth of crop that, at least to the Dutch gardener, is worth all the time and toil necessary to reclaim it.

I saw another field of several acres where, instead of removing the sand, an average of about nine feet of sand was turned upside down to bring the sea clay on top and to thus make a fertile field where a waste of sand existed previously. All of which demonstrates that land is considered very precious in a densely populated country. We hardly appreciate as yet the value of our rich boundless prairie.

### HUMAN VERSUS BOVINE TUBERCULOSIS. MAN AND BEAST CAN INFECT EACH OTHER

Guy E. Mitchell

When Professor Koch, the noted German tuberculosis expert, presented his views before the International Tuberculosis Congress now being held in the National Capital to the effect that the human family is in only the slightest danger of infection from tuberculous cattle and bovine products such as milk, butter, cream, etc., it appeared as tho a thunderbolt had been thrown into the camp of the opposition, with the result that the meetings of the various sections this week brought out lively discussions to disprove the German scientist's opinion.

Each of the experts based his address on the supposition that tuberculous cattle are a great danger and menace to mankind. Not one of them failed to call attention to the existing lack of the existing lack of united action thruout the country in the eradication of tuberculosis in cattle.

Doctor Detre of France argued in a practical way that man is apt to become inoculated with bovine tuberculosis, and produced twelve patients on whom he had tested his cutaneous reaction theory. These twelve men were inoculated with three separate solutions, known as Koch tuberculin, human tuberculin and bovine tuberculin. The results showed that Dr. Detre has discovered a new method of diagnosing early cases of consumption.

Dr. Detre lined up his patients on the platform and had them roll their coat sleeves up, exposing to view on each arm

three little red spots which looked like mosquito bites. The doctor previously explained that each of the men was afflicted with tuberculosis in some form and had volunteered to act as subjects for the experiment. The little mosquito bites indicated to Dr. Detre just what kind of tuberculosis the patient had and how long he had it. Speaking simply the result was on this order:

Each person was inoculated with the three solutions. In cases where the patient has what is known as human tuberculosis the human tuberculin reacts greater than the other solutions. The reaction is what causes the mosquito bites. The other two solutions react, but not so violently. In the case where the patient had bovine tuberculosis the bovine tuberculin made a larger mosquito bite. Of the twelve men it was found that eleven had human tuberculosis, while the other was afflicted with the same disease but of bovine origin. Other experiments made with nine children in the tuberculosis ward of the Children's Hospital, showed that seven of the little ones had human and one bovine tuberculosis, the other having the disease in a mixed character.

Doctor D. Arthur Hughes, veterinary expert of Cornell University issued a statement in which he disagrees entirely with Dr. Koch and claims that American scientists in a solid body are turning away from the "great master." He stated that the time is ripe for cooperation to bring about a national fight against danger from tuberculous cattle.

Dr. C. J. Marshall of Philadelphia, presented the theory again that tuberculin may be used in diagnosing cattle, and stated that for fifteen years its use had been watched and carefully studied. He said that he had yet to find a single case where the use of tuberculin as an agent for determining whether or not the animal was contagious had produced unfavorable results. His idea is that tuberculosis can be gradually eliminated from every herd in the world by the use of tuberculin.

In speaking of the work of the Department of Agriculture, Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, said:

"Reports of tuberculin tests made in the fifteen years from 1893 to 1908 by Federal, State and other officers with tuberculin prepared by the Bureau of Animal Industry have been carefully analyzed. Out of 400,000 cattle tested (mostly dairy cattle) there were 37,000 reactions, or 9.25 per cent. The accuracy of the tuberculin test has been confirmed in a remarkable way by post-mortem examinations. Out of 23,869 reacting cattle slaughtered, lesions of tuberculosis were found in 23,585, a percentage of 98.81. Properly prepared tuberculin applied by a competent person



is therefore shown to be a wonderfully reliable agent for diagnosing tuberculosis. In cases where the test appears to give unsatisfactory results this is usually due to the use of a poor quality of tuberculin or to ignorance or carelessness in applying it."

#### Healthy Animals the First Consideration

The general trend of the various plans suggested at the congress is to procure dairy cattle free from tuberculosis and once having achieved that end to maintain conditions clean and sanitary.

The most striking exhibit along this line is that shown by the New York State Experiment Station where a complete plant for the production of certified milk is in operation. A model dairy barn in a reduced scale with stanchions for two cows, with concrete floor, sheet metal milking stools, sterilizing apparatus, etc., was erected in the courtyard of the New National Museum building. Two of the attendants from the New York Station carry on the operation of producing milk under sanitary conditions and for this purpose two tuberculin-tested Guernseys from the dairy farm of the National Soldiers' Home in Washington were loaned. It is worthy of note that on September 30, 1908, the milk produced that day showed but 700 bacteria to the cubic centimeter, whereas the ordinary city milk supply contains anywhere from 20,000 to 30,000 bacteria in a cubic centimeter. During the entire time the plant has been operation during the congress the percentage of bacteria in a cubic centimeter of milk has never run higher than 1000. All that is required to produce this result is cleanliness—hands, utensils, stalls, buildings and the animals themselves. While the cost may be greater there are people always willing and ready to pay for pure milk.

It is explained by officials of the Department of Agriculture that the dairyman alone is not to blame for impure milk. As a rule he attempts to supply a pure milk to his customers and is not conscious of the impurities and infections in the article he is distributing. The price he receives is too low for the production of a constantly pure milk. He should be better paid. If the money that now goes to druggists, doctors, undertakers and burial grounds directly thru the use of impure and unwholesome milk could be diverted to the dairyman, he would be amply paid for producing a wholesome, safe milk and the entire community would profit by having better health, fewer deaths, and less suffering.

The wisdom of the meat inspection law was exemplified in the exhibit of the Bureau of Animal Industry. Under glass cases were shown quarts of tu-

bercular beef, and the vitals of hogs, all bearing the sign "United States Department and Agriculture—**Condemned**." So great an effect did these exhibits have on the hundreds who viewed it that many of the visitors left hurriedly declaring "I'm a vegetarian from this day." And this not without reasons for the meat was reeking with lesions where the tubercle bacilli had left its deadly scar and showed the insidiousness of the dread disease.

#### Rust-Resistant Asparagus

Owing to the prevalence of rust in the asparagus beds of New England and the Pacific Coast, serious consequences have been feared among the growers in those sections. This disease, it appears, comes on after the beds have been well established and by gradually weakening the plants results in great loss to the grower and in the ultimate destruction of the plants. When the attention of the Department of agriculture was called to this condition it was found that while spraying met with but a fair measure of success, it seemed to be most desirable that attempts should be made to secure types of asparagus which would be able to resist the rust. To this end collections of asparagus have been made from various sections of the world, and in cooperation with the Massachusetts Experiment Station, work was begun in the matter of securing rust-resistant types.

In the greenhouses of the Department of Agriculture, however, Mr. George W. Oliver, under the direction of Professor B. T. Galloway, Chief of the Bureau of

Plant Industry, secured a hybrid by crossing native varieties with a species of South African asparagus secured by Mr. David Fairchild which seems to be rust resistant. This South African species it is claimed has some other advantages over our types. The young growths are edible even when a foot high, and altho the stalks are more slender than those of our cultivated types, this variety will probably prove a valuable addition to our stock of horticultural crops. Successful hybrids have been secured between the South African species and various varieties of our own asparagus. The ability of these plants to resist rust is yet to be determined, but the fact that the Department has been able to secure the hybrids and that these hybrids, so far as appearances go, give every indication of possessing qualities of value, is worthy of note.

#### Spraying Potatoes

Paris-green, or some arsenical spray is a conceded necessity in potato-growing where the potato bug is prevalent. The beneficial effect using Bordeaux mixture in combination with the arsenical poison is shown in some experiments conducted by the Vermont Experiment Station. A row of potatoes sprayed four times with the combination mixture—Bordeaux and Paris-green—yielded 240 pounds of potatoes. An adjoining row sprayed three times yielded 206 pounds, but a row sprayed with Paris green alone yielded only 137 pounds, and of the last nearly one-half were small unsalable potatoes.

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The results, it is stated, are entirely in harmony with those of the experiments of preceding years. Some years the gain is large, in others it is smaller; but in any case it pays to spray with the combination mixture and so to insure a full crop. Experimental sprayings have been systematically made by the Vermont Station since 1891 and gains have always resulted over unsprayed fields ranging from 32 to 224 bushels per acre.

While it is almost impossible to keep accurate account of the income on farms from poultry and poultry products, it is estimated that more than \$600,000,000 may be regarded as the value of the poultry and eggs produced on farms in 1907. The amount may be larger and probably is, for this industry has advanced at such a rapid rate that no arithmetic can keep up with it. The farm price of eggs in 1899 was 11.15 cents a dozen, as an average for the United States, while in 1907, it was 18.2 cents.

The animals sold from farms and slaughtered on them in 1907 were worth about \$1,270,000,000.

#### Useful Soil Bacteria

A very intimate relation exists between the fertility of a soil and its bacterial life. It is therefore important to know the conditions of the soil which are most favorable to the rapid development of soil bacteria, for upon these will depend plant growth. Acid soils are infertile because the soil bacteria cannot grow in them. Lime, when applied to land, assists in the decomposition of organic matter in the soil, but indirectly. Lime neutralizes the acidity of the soil and renders it more favorable to the development of soil bacteria, which are the true agents for the decomposition of organic matter. A very fertile soil may be so water-logged as to be almost entirely unproductive. Why? The excessive amount of water cuts off to a large extent the supply of air which is required by the bacteria. Muck beds are rich in nitrogen, and often contain considerable phosphorous and potassium, but they will not produce good crops. Make them a fit habitation for soil bacteria, that is, drain them and correct the acid condition, and they become heavily productive. Acids in the soil may also bring into solution minerals that have a poisonous effect upon crops as for example, compounds of iron and alumina. The whole difficulty must be met by overcoming the injurious effects of soil acids. But nature has provided a cheap neutralizer of acid soils.

Lime in some of its forms is the most economical. It exists in several avail-

able forms; it may be had as quicklime, hydrated lime, air-slacked lime; and finely ground lime-stone (The unburned rock, finely ground). It is also contained in shells, marl, wood-ashes, lime-kiln ashes, and slag phosphate, and occurs, in combination with other elements in phosphate rock. A study of the soil and proper use of lime in some of its forms, combined if necessary with adequate drainage, can be relied upon to bring about a soil condition which will favor the growth of bacteria friendly to maximum crop production.

It is stated that the territory at present available for wheat production, 240,000,000 acres, is capable with the present average yield per acre,  $12\frac{1}{2}$  bushels, of producing enough wheat for only 600,000,000 people, assuming the average annual consumption per head to be  $4\frac{1}{2}$  bushels. At the present rate of increase the population of wheat-eating inhabitants of the world will reach this number in 1910. With better methods of culture and more liberal use of fertilizers it should be possible to increase the average yield from  $12\frac{1}{2}$  to 20 bushels per acre, but it is estimated that to do this would require 12,000,000 tons of nitrate of soda. Judicious planting of legumes, which take the nitrogen from the air, will aid in the increased production of wheat, and we have no fear that there will be a famine in either the grain or nitrogen markets.

#### TUBERCULOSIS

Dr. A. D. Melvin, Chief of the Bureau of Animal Industry of the United States Department of Agriculture, in an address before the International Congress on Tuberculosis at Washington, (Tuesday morning, September 29), pointed out the heavy economic loss sustained by the live-stock industry because of tuberculosis, and discussed measures for the control and eradication of this disease. Dr. Melvin said, in part:

"While the saving of human life affords the highest motive for combating tuberculosis, the prevention of financial loss is alone a sufficient reason for undertaking the eradication of the disease from farm animals.

"Statistics of the United States Federal meat inspection for the fiscal year ending June 30, 1908, covering 53,973,337 animals, or more than one-half of all those slaughtered for food in the country, show the following percentages of tuberculosis: Adult cattle, .961; calves, .026; hogs, 2.049; sheep and goats, 0. The proportion of tuberculosis is probably higher in animals slaughtered without inspection.

"Reports of tuberculin tests made in the 15 years from 1893 to 1908 by Feder-

al, State, and other officers with tuberculin prepared by the Bureau of Animal Industry have been carefully analyzed and tabulated. Out of 400,000 cattle tested (mostly dairy cattle) there were 37,000 reactions, or 9.25 per cent.

"From these two classes of statistics it is concluded that on an average about 10 per cent of the milch cows, 1 per cent of other cattle, and 2 per cent of the hogs in the United States are affected with tuberculosis, the average percentage for all the cattle being estimated at 3.5'

"The accuracy of the tuberculin test has been confirmed in a remarkable way by post-mortem examinations. Out of 23,869 reacting cattle slaughtered, lesions of tuberculosis were found in 23,585, a percentage of 98.81. Properly prepared tuberculin applied by a competent person is therefore shown to be a wonderfully reliable agent for diagnosing tuberculosis. In cases where the test appears to give unsatisfactory results this is usually due to the use of a poor quality of tuberculin or to ignorance or carelessness in applying it.

"The economic loss on account of tuberculosis in food-producing animals is heavy. The loss on animals in which tuberculosis is found in the Federal meat inspection is estimated at \$2,382,433 annually, and if the same conditions were applied to animals slaughtered without Federal inspection the annual loss on all animals slaughtered for food in the United States would be increased to \$4,102,433. The stock of animals on hand is also depreciated in value because of tuberculosis. Assuming that living tuberculous milch cows are annually depreciated to the extent of one-tenth of what the loss would be if they were slaughtered, other cattle one-third, and hogs one-half, the total annual depreciation amounts to \$8,046,219. The annual loss from decrease in milk production is estimated at \$1,150,000, and there also is some loss from impairment of breeding qualities, etc. Taking all these items into account, the aggregate annual loss because of tuberculosis among farm animals in the United States is estimated at not less than \$14,000,000.

"Such heavy financial losses make the eradication of tuberculosis from farm animals very desirable purely as an economic matter. As the disease is found principally among cattle and hogs, and as most of the infection in hogs is derived from cattle, the main effort should be directed against the disease in cattle. Among the measure proposed are the following: Live stock owners should be educated by means of official publications, the agricultural and general press, lectures at farmers' institutes, etc. Public authorities should make a systematic effort to determine to what extent and in what localities the disease exists, and should apply the tuberculin



test generally and systematically to cattle in sections where this seems desirable. Reacting animals should be slaughtered under competent veterinary inspection, so that the loss may be minimized by passing carcasses for food where the infection is so slight that this can safely be done; dangerous carcasses, of course, to be condemned. In the case of valuable breeding animals where slaughter would involve great sacrifice, the Bang system of segregation may be used. A system of tagging all cows sent to market is advocated, so that when animals are found tuberculous in the meat inspection they may be traced back to the place of origin, centers of infection located, and steps taken for eradication. The Bureau of Animal Industry is already cooperating with the authorities of some States in reporting and tracing the origin of tuberculous animals. Each State should require that all cattle brought in for breeding or dairy purposes shall have passed the tuberculin test.

"As the eradication of tuberculosis is largely a public health measure, it is only reasonable that the persons whose cattle are slaughtered should be paid indemnity, at least in part. This is not only just but is absolutely essential if the cooperation of cattle owners is to be secured. Several states already have provisions of this character.

"The benefits to follow from the eradication of tuberculosis from farm animals are so great and so obvious that the necessary expenditures, even tho they must be heavy, may be regarded as a highly profitable investment."

#### **HARD SPRING WHEAT LEAGUE OF NORTH DAKOTA AND NORTHERN MINNESOTA**

Moorhead, Minn., Sept. 14, 1908.

Why people living in the Hard Spring Wheat country should eat bread made from Hard Spring Wheat flour.

The demand for any article establishes its value. With increased demand, enhanced values will result. Reduce the demand, and values will recede.

Fife and Blue stem wheat, such as raised in the Dakotas and Northern Minnesota, is the highest grade of wheat produced, and its value much the highest in the markets of the world.

The price difference between this wheat and wheat raised in the Southwest, notably Kansas, has caused certain former Hard Wheat millers, outside of the Hard Wheat territory, to use largely of this cheaper southwestern wheat, mixed with Durum, in the production of their flour. And it is these cheap mixtures that are being industriously offered for sale thruout the Hard Wheat country, and represented as being

the PRODNCT OF HARD WHEAT, to the great detriment of the producer of Hard Wheat and the manufacturer of its products.

If people in the Hard Wheat country substitute flour made from the above named mixtures for their own Hard Wheat product when making purchases for their consumption, because of the cheapness of the said mixtures, they will reduce the demand for the home product in just that proportion. Ann they will hasten the time when the premium now being paid for Fife and Blue stem wheat will be discontinued and the price placed upon an even basis with the inferior southwestern wheat.

Such reduction would mean a heavy loss to the producer of Hard Wheat, and North Dakota alone would be the loser of some millions of dollars annually. Previous to this season the usual difference in price between 1 Northern and Kansas wheat was from 7 cents to 8 cents per bu. It therefore requires no mathematician to become convinced that a barrel of flour made from Kansas and Durum wheat, in Minneapolis, costs much less than does a barrel of flour made from Northern Hard Wheat in North Dakota. The difference in price between 1 Northern and Durum wheat runs from 15 cents to 18 cents per bu.

A barrel of flour made from Northern Hard Wheat will make many more loaves of bread than will a barrel of Kansas and Durum mixtures, because of its greater strength.

Buy only the best flour on earth—made from wheat raised in your own state—on your own farms. Your own interest demands this of you. Do not be deceived by the delusive talk that the mixtures are cheaper. They are not cheaper, but are in the end much dearer.

#### **WORK OF THE NORTH DAKOTA GEOLOGICAL SURVEY DURING THE PAST SUMMER**

**Professor A. G. Leonard, University of North Dakota**

During the past summer work was carried on by the North Dakota Geological Survey both in the eastern and western portions of the state. The investigation of the coal fields of Billings County was continued and together with the information gathered in previous years, sufficient material has now been secured for the preparation of a detailed report on the coal deposits of this part of North Dakota. This region was selected for detailed study because of the excellent opportunity afforded in the Little Missouri bad lands for the examination of the coal beds, where these are so well exposed in numerous outcrops.

The party working in Billings County was in charge of the State Geologist, Dr. A. G. Leonard, and with him were two University students, Edgar H. Wells and Harry A. Hanson. It was found that no less than 21 workable coal beds are present in that county alone, not all of them occurring at any one point but some being found in one locality and some in another. These 21 coal beds range from 4 to 35 feet in thickness and are distributed thru from 100 to 1200 feet of strata. The total thickness of the coal in these 21 seams is 100 feet.

Some of the individual coal beds cover large areas. One, with a thickness varying from 5 to 16 feet, has a known extent of 20 miles in one direction and 25 miles in another, with an area of at least 500 square miles and probably much greater. Another seam of coal was traced 36 miles north and south, and 24 miles east and west, and while its known area as shown from outcrops is nearly 200 square miles, it undoubtedly has an extent of 1000 to 1500 square miles. This coal bed, with a thickness ranging from 9 to 16 feet and over, has been largely burned out or removed by erosion, but it still underlies a number of townships.

At least half a dozen coal beds were discovered which were not before known to occur. The lowest coal seams in the geological column, and therefore the oldest, are those found in the vicinity of Yule, in southern Billings County. The highest and youngest are those which appear in Sentinel Butte and in the northeastern part of the county.

It is interesting to know that according to the estimates of the United States Geological Survey, North Dakota has 500 billion tons of coal, or more than any other state in the Union. It is the function of the State Geological Survey to make these coal resources known as widely as possible, in order that they may be developed, and this the Survey is doing in its reports, which deal with the coal and clays of the region.

The discovery of the large fossil bones of enormous land reptiles (Dinosaurs) was another important result of the summers field work. These were found in the badlands, a few miles from the new town of Marmarth and several large boxes of them were shipped to the University to add to its collection. Many of these huge bones were buried in the clays of the region, and some had been washed out and were lying on the surface. This discovery is of increased importance owing to the fact that these fossil bones will make it possible to determine the age of the strata in which the fossils occur, the age of the formation having been in doubt up to the present time.

The work in the eastern part of the state was in charge of Mr. J. G. Barry, of



the State University, and consisted in the mapping of the geological formation of Pembina and Cavalier counties and adjoining portions of Walsh and Ramsey counties. It was found that the north-eastern part of North Dakota can be divided on the basis of its topographic features, into three distinct districts, namely: the Red River Valley; the deeply dissected Pembina Mountains bordering the valley on the west; and the high rolling prairie which forms the greater part of Cavalier county.

The origin, physical character and drainage of the Red River Valley were studied. Occurrences of sand and gravel and the old beach lines of glacial Lake Agassiz were mapped. The lack of watersuitable for domestic purposes is an important problem in parts of the Red River Valley. Data in regard to wells and character of waters were collected. The Survey will present these facts in a systematized form, and hopes to make suggestions which will enable people living in those districts to solve the problem.

The origin, physical characters and economic resources of the Pembina Mountains were studied. These natural resources are brick shales, cement rock, sand and gravel. Such material in regard to these was gathered in addition to that already secured the year before by Mr. V. J. Melsted, and will enable the Survey to prepare a report on the cement resources of the state.

The greater part of Cavalier county is a glaciated, rolling, imperfectly drained prairie. Its origin, character and drainage were studied and will be discussed in full in the forthcoming Fifth Biennial Report. Deposits of sand and gravel were mapped where they had been exposed by natural and artificial means, such as road making. A small amount of time was spent in studying the terminal moraines, which are not developed in a very decided way.

During the early part of September, the gas wells of Bottineau County were visited. Much data was collected in regard to the depth, pressure, characteristics and apparent quantity of the gas deposits. In general, the productive area seemed to be restricted to the neighborhood of the Parker Farm, 2½ miles south of Westhope. The gas occurs in a shallow trend, the top of the gas bearing sand being about 170 feet below the surface at the base of the glacial drift, and the sand layer being about 20 feet thick. It is reported that the pressure is sufficient to blow off at least 2,000,000 cu. ft. per day. Prospecting is now going on to strike deep-seated and extensive bodies of gas. Gas is also reported about 6 miles northwest of Mohal. The parties in charge of the prospecting for gas are thoroly in sympathy with the work of the Survey, and will keep it in-

formed of the progress made and of the strata encountered during the search.

#### LUMBER FROM STRAW

Among the exhibits at the late state fair at Fargo was a cottage constructed of timber manufactured from straw, which attracted much attention. The building was designed to show the possibilities of manufacturing a cheap and durable substitute for lumber in the construction of ordinary buildings.

It is claimed for this manufactured lumber that it is water proof, rat proof and a non-conductor of electricity. The boards can be made of any desired size, are as strong as wooden boards, can be sawed, planed and nailed in place as readily as wooden boards, take paint readily and are very durable.

In the manufacture of this substitute lumber common wheat straw mixed with other ingredients is subjected to hydraulic pressure. What

ingredients are used with the straw is known only to the inventor who claims they are cheap and readily accessible and that the product can be profitably manufactured and sold at one-half the price of lumber.

If this is true, treeless North Dakota may become one of the most extensive building material producing states in the Union. Griggs county alone produces and burns enough straw annually to manufacture a large amount of lumber and factories could secure supplies at a low price. Should a factory be established at Grand Forks, as now seems probable, it will soon demonstrate whether relief from the tentacles of the lumber trust may not be secured by utilizing our waste farm products to curtail the demand for natural lumber.—Griggs County Courier.

If you are interested in the West, send 25 cents in stamps for four late issues of The Pacific Monthly, containing fully illustrated descriptive articles about dairying, fruit growing, poultry raising and general farming conditions in Oregon, Washington and Idaho.

PACIFIC MONTHLY, Portland, Ore.

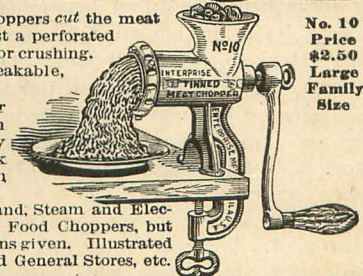
## ENTERPRISE

### Meat and Food Chopper

"Enterprise" Meat and Food Choppers cut the meat with a revolving steel knife against a perforated steel cutting plate without tearing or crushing. Easily cleaned. Practically unbreakable, and will last for years.

The No. 5 "Enterprise" Chopper costs only \$1.75. No. 10, shown in cut, \$2.50. They are standard family sizes, and not only save half the work at butchering time, but are useful in the kitchen every day in the year.

Made in 45 sizes and styles for Hand, Steam and Electric Power. We also make cheaper Food Choppers, but recommend the above for the reasons given. Illustrated catalog free. Sold at Hardware and General Stores, etc.



No. 10  
Price  
\$2.50  
Large  
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Size

## ENTERPRISE

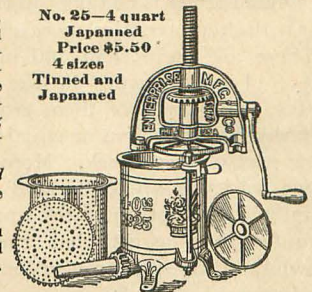
### Sausage Stuffer and Lard Press

Lessens the labor at butchering time. Two machines in one. Well made and does its work quickly and surely. Cylinder is bored true and plate fits accurately. Pressure cannot cause meat to rise above the plate. The Patented Corrugated spout prevents air from entering casing, ensuring perfect filling and preservation of sausage.

Machine can be changed into a Lard Press in a minute's time. Can also be used as a Fruit Press.

Your dealer should be able to supply you with the "Enterprise" Sausage Stuffer and Lard Press. If not, order direct of makers.

No. 25—4 quart  
Japanned  
Price \$5.50  
4 sizes  
Tinned and  
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## ENTERPRISE

### Bone, Shell and Corn Mill

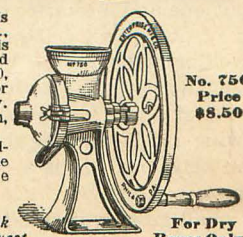
The "Enterprise" Bone, Shell and Corn Mill is a good, general mill for farmers, poultrymen, etc., and for compactness, strength and durability is unexcelled. Handy for grinding poultry food and making bone meal fertilizer. Mill shown in cut \$8.50, weight 60 lbs., grinds 1½ bu. corn per hour. Look for the name "Enterprise" on the machine you buy.

Grind up dry bones, oyster and other shells, corn, etc., for your hens and watch results.

Other famous "Enterprise" household specialties are: Coffee Mills; Raisin Seeders; Fruit, Wine and Jelly Presses; Cherry Stoners; Cold Handle Sad Irons, Etc., Etc.

Sold at Hardware and General Stores, etc.

Write for "The Enterprising Housekeeper," a book of 200 choice recipes and kitchen helps. Free on request.



No. 750  
Price  
\$8.50

For Dry  
Bones Only

THE ENTERPRISE MFG. CO. of PA., 236 Dauphin St., Philadelphia, Pa.



## LARGE DEMAND FOR WILLOW BASKETS

The fact that a Chicago merchant is advertising in German trade papers for a million willow clothes baskets is pointed to by experts on willow culture in this country as evidence of our neglect of a profitable industry.

Climate and soil are as favorable for willow culture in this country as in Germany or anywhere else, and the market for willow of the better grades is the best in the world. Generally speaking, land that will grow wheat will grow willows. Their cultivation is not difficult, and profits are usually good. But up to the present time Americans have not taken hold of the matter in earnest, tho both interest and production have been on the increase of recent years as a result of the efforts made by the Department of Agriculture to inform the public of the opening which willow growing offers.

The Germans handled the business well. They have industrial schools where basket weaving is taught. Many of these schools grow their own willow rods, cut them, and peel and prepare them for use. To the mutual advantage of both pupils and proprietors, arrangements are made to allow pupils to work part of the time in the "holts," as the willow fields are called, belonging to the schools, and in that way earn enough to pay their tuition and board. They then become familiar with all parts of the business, and when they graduate they are competent to take places as overseers of willow farms or foremen in wicker ware factories.

American willow growers and manufacturers of willow ware must meet that competition; but those who have investigated conditions here and abroad feel confident that the American has advantages which will enable him to compete successfully if he takes up the business with characteristic American energy.

There are more than 160 manufacturers of willow ware in the United States. One-tenth of them grow their own willows, and about an equal number grow part of their stock. More than a dozen varieties are cultivated in this country, in seventeen states, and many manufacturers assert that the home grown rods are equal or even superior to the imported. Good holts pay a profit the first year, tho the profits of later years are much greater. The average price of unpeeled rods last year was about one and a quarter cents a pound, and of peeled rods about seven cents. A well-managed willow holt should average twenty-five hundred pounds of rods to the acre yearly, and the cost of growing and harvesting the crop is comparatively low. It is a crop which requires comparatively little labor, so that the small grower, if able-bodied, can be pretty independent in the matter of hired help.

Instructions for the growing of basket willows are sent out by the Forest Service, upon request, together with a statement of the returns to be expected. The Service is devoting special attention to testing every known variety of basket willow in order to find the best varieties for home growers.

## DIRECTIONS FOR DESTROYING POCKET GOPHERS

David E. Lantz, Assistant, Department of Agriculture, Washington, D. C.

Pocket gophers infest all the States and Territories west of the Mississippi, and parts of Illinois, Wisconsin, Florida, Georgia, and Alabama. They occur also in southwestern Canada and over the greater part of Mexico. All the species live underground in ramifying tunnels, and all bring to the surface quantities of earth, which is heaped up in the shape of mounds. The habits of these animals are everywhere much the same.

Thruout their range pocket gophers are very destructive to crops. They eat the roots of fruit trees and in this way sometimes ruin whole orchards. They eat both roots and tops of clover, alfalfa, grasses, grains, and vegetables, and are especially harmful to potatoes and other tuberous crops. Besides this, they throw up innumerable mounds of earth in meadows, pastures, and grain fields, which cover and destroy far more of the crop than is eaten by the animals or killed by having the roots cut off. These mounds also prevent close mowing, so that much of the hay crop is lost, and the pebbles they contain often break or injure farm machinery. The loss due to gopher mounds in the clover and alfalfa fields in some of the Western States has been conservatively estimated at one-

tenth of the entire crop. In many of the fertile valleys where they abound the animals are by far the most formidable of the farmer's mammalian enemies. In addition to all this, in the far west they burrow in the banks of irrigation ditches and thus cause extensive breaks, the repair of which results in the expenditure of much time and money.

Pocket gophers may be destroyed by poison, by traps, and by the use of carbon bisulphid.

## Nursery Stock.

Buy your nursery stock and seeds of the Clinton Falls Nursery Co., Owatonna, Minn. They will use you right.

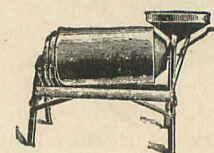
## Trappers---Fur Traders

Ship your Furs direct to the World's largest Fur market, where prices are always highest. Write for our latest Price List, giving highest prices for Furs and Pelts of all kinds from all sections. It's FREE.

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## JUMBO The Greatest Grain Grader and Cleaner.

Capacity 60 bu. per hour.



Separates wild or tame oats from wheat and barley, and at the same time takes all the foul seeds out of your seed wheat and grades it better than any other fanning mill made, in fact the Jumbo is the only successful grader on the market today. The Jumbo will clean your flax better than any other cleaner. The JUMBO has 48 sq. ft. of galvanized wire cloth to do the work on six times as much as any other machine, and our sieves always remain clean and for that reason the JUMBO will do more and better work than any other. We have a Special Cockle Mill. Our No. 3, is the only Perfect Cockle Separator and is sold altogether to people who have other makes of cleaners, so-called fanning mills. We, therefore, want to say to the farmers, be sure to buy right the first time, to save buying twice. Our machines are guaranteed to give satisfaction. Write for free catalog and terms. Machines sent on trial.

MINNEAPOLIS SEPARATOR CO.,  
310 Erie St. S. E.

## First Cost the Only Cost

Look to the future when you buy your wagon and buy it once for all. For the same money you would pay for a good wooden wagon you can get

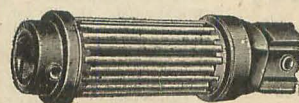
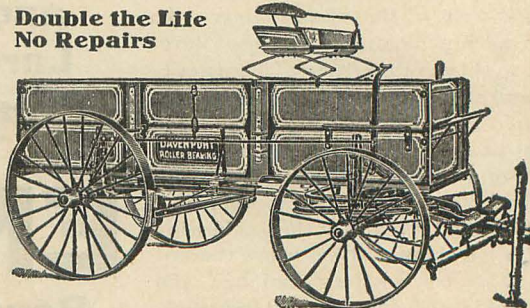
**Double the Strength  
No Breakdowns**

**Double the Life  
No Repairs**

By buying the

## Davenport Roller-Bearing Steel Wagon

It is practically all steel—trussed steel wheels, steel gears, steel hubs like the modern automobile—nothing to dry apart or get loose.



## The Roller-Bearings

Make 30% to 50% Lighter Draft

This is the greatest advance ever made in wagon building. They are dust, sand and water-proof. Need oiling only occasionally, oil without removing wheels all about the Davenport Roller-Bearing Steel Wagon. Let us show you why it's the only wagon you can afford to buy. Send for free Catalog R and do it today, before you forget.

**Davenport Wagon Company, Davenport, Iowa**



### Poisoning Pocket Gophers

Poisoning with strychnine is the most effective means known for killing pocket gophers, and, as it involves the least expenditure of money and labor, the Biological Survey recommends it for general use. As a rodent poison to be used by farmers, strychnine has several advantages. Its action is sure, its deadly character is known to most persons, and its bitter taste is an additional safeguard against mistaking it for a harmless drug. Strychnia sulphate is the most convenient form of the poison, since it is freely soluble in hot water and in the natural juices of vegetables used as bait. To disguise its bitterness so that rodents may not be deterred from eating the baits, sugar is often employed, or the strychnine may be mixed with its own bulk of commercial saccharine. A sugar sirup poisoned with strychnine may be used with excellent results. It is prepared as follows:

Dissolve an ounce of strychnia sulphate in a pint of boiling water. Add a pint of thick sugar sirup, and stir thoroughly. The sirup is usually scented by adding a few drops of oil of anise, but this is not essential. If preserved in a closed vessel, the sirup will keep indefinitely.

The above quantity is sufficient to poison a half bushel of shelled corn or other grain (corn recommended). The grain is steeped in hot water and allowed to soak over night. It is then drained and soaked for several hours in the poisoned sirup. Before using, corn meal may be added to take up the excess of moisture.

Dry crystals of strychnine also may be used. They are introduced, by means of a knife, into small pieces of potato, carrot, or sweet potato, or into entire raisins or dried prunes. A single large crystal (or several small ones) is enough for each bait. Raisins are especially recommended because they are easily handled and contain enough sugar to disguise the bitterness of the poison.

Pocket gophers in ditch banks may be poisoned in the following manner: Select the freshest hill or mound and with a narrow garden trowel follow the soft earth of the tunnel until the main runway is reached. By noting the direction from which the earth was pushed out and locating the closed entrance, the burrow may be readily followed and the main runway quickly found. The poisoned raisin, corn, or small potato should be placed well back in the main runway and the opening closed. It is usual for one gopher only to occupy the burrows connected with a group of hills, and when the burrow remains open it indicates that the animal has been killed.

### Trapping Pocket Gophers

Trapping is a successful method when followed intelligently and persistently.

It is especially adapted to small fields, orchards, gardens, and irrigation embankments, where only a few gophers are present; but in the case of large areas that are badly infested, the method involves too much labor.

For trapping gophers an ordinary No. 10 steel trap may be employed with success, but there are on the market several special gopher traps which are better adapted for general use.

In using the ordinary steel trap, the first step is to make an opening into the main gopher tunnel. The trap should then be sunk so that the jaws are level with the bottom of the runway and lightly covered with green clover, alfalfa grass, or even loose soil, care being taken that these do not clog under the pan, or trigger. No bait is required. The hole should be just large enough to receive the trap and should be covered so as almost to exclude the light. Scalding the trap frequently to remove the animal odor is important.

Some of the special gopher traps possess the advantages of ease and simplicity of operation, and kill the animals instantly. These special traps should be set in the laterals leading into the main tunnel of the gopher, or at the entrance of open burrows where fresh earth is being thrown out. The trapper should choose the freshest of a series of mounds and dig along the lateral until it is found clear of soil.

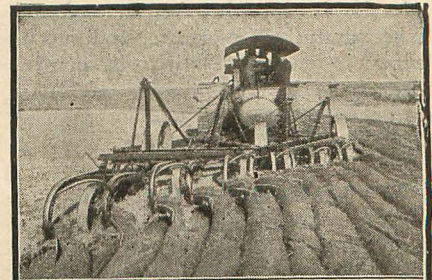
### Carbon Bisulphid

Carbon bisulphid has been employed for killing pocket gophers, and under favorable conditions its use is recommended. If the burrows are extensive or the soil dry, the gases are dissipated so rapidly that a large quantity of the liquid is required to kill the animals and the method becomes too expensive. If, however, the burrows are simple and the soil moist, bisulphid may be used successfully. For pocket gophers an ounce of the liquid for each burrow is sufficient. The carbon bisulphid is poured over a bunch of cotton, rags, or

other waste material and this quickly pushed into the burrow, which should be closed at once.

### Cooperation

Any farmer may readily rid his premises of gophers by the use of poison or traps. Unless, however, the entire community unites in active and intelligent cooperation in the destruction of



## THE PLOW FOR YOU IS THE Reeves Flexible Frame Steam Lift Engine Gang Plow

And you can procure it in sizes suitable for small or large power, small or large farms, and for use in connection with any make of Steam Traction Engine.

The Reeves Engine Gang Plow is the only fully successful Engine Gang Plow—for it is the only one adapted to all conditions of land. It is equally satisfactory on rough or rolling land, as on level fields. Is suitable for use in small or large fields. You should have one now for fall work. You can not only do your own plowing but the plowing of the entire community. Your plow is sure to prove a most profitable investment.

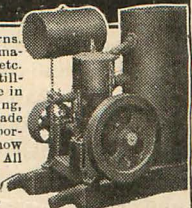
This Plow and the Reeves Plowing Traction Engine are fully described in a large catalog on Plowing, which is sent free upon request. This catalog is full of illustrations of plowing scenes, and contains telling letters from users of both Plow and Engine. Send for it today.

REEVES & CO., 104 Fifth St., COLUMBUS, IND.

## 2 HP Stationary \$29.50 Engine

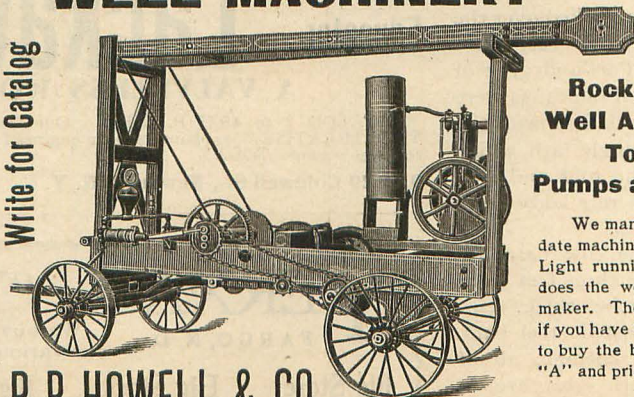
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the animals, the cleared area will be sooner or later invaded from neighboring premises, and the work of destruction must be repeated. Cooperation only will effect a radical cure. When cooperative efforts for the extermination of gophers over a considerable area are attempted, careful attention must be given to waste lands along fences, streams, public highways, and railroads. Such places are favorite haunts of the animals, because in them are found loose, sandy soil, moisture, and succulent roots for food. It is from such resorts that adjoining premises are often restocked with pocket gophers.

#### A FARM BUILT OF CONCRETE

Reinforced concrete is generally associated with large industrial buildings such as warehouses, mills or factories, and because of its use for structures of this character it has come to have a rather bad reputation as far as its artistic side is concerned. That it is possible, however, to produce structures of this material, of a character acceptable to the owner of large country farm estates as well as to the landscape architect, says **Cement Age**, is demonstrated in the group of farm buildings recently completed near Sterlington, N. Y., on the estate of Mr. F. L. Stetson. Designed as they are for the many diverse uses which occur in connection with a large estate of the character of Mr. Stetson's these buildings constitute an unusual concrete group. The care with which the design was worked out is shown in the list of rooms provided for. There are, in addition to the cow barn and hay barn, bull pens, calf pens, feed bins, root cellar, boiler room, coal bins, milk room, wash room, laundry, kitchen, grain bins, and complete living quarters for the dairyman's family.

The exterior of all of the buildings consists of a pebble-dash finish. This was composed of a mixture of sand, pebbles and cement, which was applied after the walls had been roughened or scratched at a considerable time after the completion of the buildings. A final brush coat of sand and cement was applied over the pebble-dash; this was made very thin. To contrast with the Portland grey of the walls, the roofs of all buildings were made of red semi-glazed Ludowici tile laid on one by two shingle lath which was put directly on the roof and well imbedded in cinder concrete laid on the reinforced concrete slabs.

The partitions in the cow barn are formed of solid concrete three feet eight inches high and four inches thick, reinforced with  $\frac{1}{4}$ -inch twisted steel bars. The partitions in the cottage, all of which are plastered both sides, are, in some instances, of reinforced concrete

and elsewhere of terra cotta tile, generally three-inch thick. The floors in the hay barn and cow barn have a granolithic finish one-inch thick. In the living rooms of the dairyman's cottage, however, wooden floors one-inch thick are laid on two-inch by three-inch sleepers imbedded in cinder concrete fill laid on top of the reinforced concrete floor slabs.

The waterproofing of the floor of the cow barn was done to prevent the moisture striking thru the concrete floor and giving the cows rheumatism. In all these buildings where water was likely to be used such as in the cow barn, wash room and dairy room, the floors were given a slight pitch and bell traps were set at the low points. Connecting with these traps are tile drains leading to a cess pool near the buildings.

Connected with the cow barn by means of a pergola supported on large round concrete columns is a manure shed also supported on concrete columns and enclosed with wooden screens. A light steel trolley runs from this shed to the interior of the cow barn.

The cow barn is approximately twenty-two feet by seventy-two feet; the hay barn forty-two feet by forty-two feet, two stories in height; and the dairyman's cottage is also two stories in height and is approximately forty feet by fifty feet.

#### HISTORIC FOREST FIRES

The terrible work of the flames which have burned over and destroyed hundreds of thousands of acres of timber and property to the value of millions in the Lake States, recalls to memory other great forest fires which have attained historic importance.

One of the earliest of these was the great Miramichi fire of 1825. It began its greatest destruction about one o'clock in the afternoon of October 7 of that year, at a place about 60 miles above the town of Newcastle, on the Miramichi River, in New Brunswick.

Before ten o'clock at night it was 20 miles below Newcastle. In nine hours it had destroyed a belt of forest 80 miles long and 25 miles wide. Over more than two and one-half million acres almost every living thing was killed. Even the fish were afterwards found dead in heaps on the river banks.

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Five hundred and ninety buildings were burned, and a number of towns, including Newcastle, Chatham, and Douglastown, were destroyed. One hundred and sixty persons perished, and nearly a thousand head of stock. The loss from the Miramichi fire is estimated at \$300,000, not including the value of the timber.

In the majority of such forest fires as this the destruction of the timber is a more serious loss, by far, than that of the cattle and buildings, for it carries with it the impoverishment of a whole region for tens or even hundreds of years afterwards. The loss of the stumpage value of the timber at the time of the fire is but a small part of the damage to the neighborhood. The wages that would have been earned in lumbering, added to the value of the produce that would have been purchased to supply the lumber camps, and the taxes that would have been devoted to roads and other public improvements, furnish a much truer measure of how much, sooner or later, it costs a region when its forests are destroyed by fire.

The Peshtigo fire of October, 1871, was still more severe than the Miramichi. It covered an area of more than 2,000 square miles in Wisconsin, and involved a loss in timber and other property of many millions of dollars. Between 1,200 and 1,500 persons perished, including nearly half the population of Peshtigo, at that time a town of 2,000 inhabitants. Other fires of about the same time were most destructive in Michigan. A strip about 40 miles wide and 180 miles long, extending across the central part of the State, from Lake Michigan to Lake Huron, was devastated. The estimated loss in timber was about 4,000,000,000 feet board measure, and in money over \$10,000,000. Several hundred persons perished.

In the early part of September, 1881, great fires covered more than 1,800 square miles in various parts of Michigan. The estimated loss, in property, in addition to many hundred thousand acres of valuable timber, was more than \$2,300,000. Over 5,000 persons were made destitute, and the number of lives lost is variously estimated at from 150 to 500.

The most destructive fire of more recent years was that which started near Hinckley, Minnesota, September 1, 1894. While the area burned over was less than in some other great fires, the loss of life and property was very heavy. Hinckley and six other towns were destroyed, about 500 lives were lost, more than 2,000 persons were left destitute, and the estimated loss in property of various kinds was \$25,000,000. Except for the heroic conduct of locomotive engineers and other railroad men the loss of life would have been much greater.

This fire was all the more deplorable, because it was wholly unnecessary. For many days before the high wind came and drove it into uncontrollable fury, it was burning slowly close to the town of Hinckley, and could have been put out.

#### USE LIGNITE FOR FUEL

The management of the Dakota Portland Cement Company, after a thorough investigation, have decided to install, in their large cement plant to be constructed at Chamberlain, S. D., what is known as the gas producer power plant.

This process consists of reducing fuel to a gas, which is communicated to a gas engine, from which the power is derived. This gas may also be burned in the huge rotary kilns in reducing the properly prepared raw materials to clinker, which, when ground up, is the Portland cement of commerce.

The gas producer system not only affects a saving of from one-half to two-thirds of the amount of fuel used, as compared with steam power, but its chief virtue lies in its ability to utilize low-grade fuels, which would be impracticable under steam boilers. Thus the lignite deposits of the Dakotas, which are almost useless for steam purposes, will be of inestimable value in producing gas to operate the Chamberlain plant.

The gas producer is but a recent development in the industrial field, but it is affecting a revolution wherever used.

The United States government considered this matter of such high importance that they expended vast sums of money to determine the efficiency of

this system, and the reports of these experiments show conclusively the marvelous advantage of this power over steam; the tests covering all grades and kinds of coal, peat, lignite, wood and charcoal.

By the installation of the gas producer, the Management of the Dakota Portland Cement Company feel confident they can produce high grade Portland cement at from ten to twelve cents less than their previous estimates, made on the basis of steam power.

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#### FARMERS' INSTITUTES FOR 1908-9

The management of the North Dakota Farmers' Institute is planning a series of meetings for the winter season. The circuit will commence about December 1st.

Prof. Thos. Shaw has again been secured as a lecturer for the coming season. He is making special preparation for this institute circuit.

Speakers of outstanding ability or men who have distinguished themselves along agricultural and other useful lines will be secured from time to time as opportunities afford. We hope to place the work on a higher plane than ever before.

Towns wishing to have a meeting this winter should send in their applications at an early date. Commercial or Farmers' Clubs, private individuals or organizations may apply for meetings. All the expense to the town locally will be to furnish a comfortable hall.

#### INDIANA FARMHAND WRITES ABOUT COUNTRY LIFE

An Indiana farmhand has written a letter to President Roosevelt about the work which the Country Life Commission is carrying on. The President has turned the letter over to the Country Life Commission and the Commission has asked the farmhand to write some more.

"I have been a farmhand just long enough," says the President's correspondent, "to learn the cause of so many sons and daughters and well-meaning, reliable farmhands leaving the beautiful

farm and country and going to the city. A lack of order and system on the farm and too long hours for a day is what is driving the best minds from the farm to the city and shop. What can we expect of a hand, or the farmer's wife and her posterity, in the way of intellectual development when they get out of their beds at 3:30 in the morning and work from that time until 8 or 9 P. M.? And no attention paid to the sanitary conditions of the home, and necessary conveniences on the farm for doing the farm work with the least labor and time."

This man has given the Country Life Commission some very interesting first-hand information about rural conditions and recommendations based on a long experience in farm work and farm life. He has worked for all kinds of farmers, good and bad, he says, and he has always had his eyes open to detect the causes of their success or failure. He has drawn his own conclusions and sets them forth in down-right, straight-forward fashion. Education pays in farming, he says. The farmer who plans out his work and carries it thru in a systematic, business-like manner, just as the city man does, will be able to shorten the hours of labor, "So many farmers measure everything on the farm from the standpoint of muscle," he continues, "and are extreme in some things and slack in others. I decided several years ago that life is too short to work for Peter Tumble-down farmers."

"Now, Mr. President," he writes, "you can take this for what it is worth. I have not given you half of my experience." The Country Life Commission has written him that his suggestions are so useful that they hope he will send more.

"Compel the farmer to be a business man," he says—"Go into the homes of some of the farmers and the so-called farmers and ascertain how they live, and learn of their methods of doing the business in which they are engaged. And you will be surprised what a variety you will find. Ascertain what they read, and what stress they put on the literature that comes into their homes (if any comes) bearing on the business they are engaged in. See what per cent study their business.

"Give me the educated farmer as a boss and the educated farmhand as a hand. When I come in contact with a hand or farmer that studies his business I find him advancing, and it is a pleasure to work for such men.

"The majority of the farmers are eight-hour men, that is, eight hours in the forenoon and eight in the afternoon. Eight or ten hours on the farm cannot well be adapted in all cases, but it need not be from fourteen to sixteen hours. If the family arise every morning at 5 o'clock and the wife and daughters at-

tend to the household duties, and the farmhands and sons attend to the chores and go to the field at 7 o'clock and work until 11 or 11:30 and go to the field again at 1 and keep at it until 6 o'clock, and go to the house and eat the supper and then do the evening chores, they have done a farm day's work. Regular hours for work, and regular hours for meals, and regular hours for sleep, and regular hours for rest and recreation, with plenty of standard papers and books, including the best agricultural papers and books, and a full faith in God, and good grub is wanted.

"The family should rise at 5 o'clock on Sunday morning as well on on week days, and do the necessary Sunday morning chores, and then go to church and show the business man in the city that Sunday on the farm does not consist in changing the stock from one field to another, or salting it, or unloading a load of hay that was brought in on Saturday evening.

"Coming to the meals at the meal hour makes it easy on the wife so she can arrange her household duties in order, as can also the husband his farm work.

"Men of worth and standing in the shop and city tell me that if order and system were used on the farm they would go back to the farm. If the farmer wants to keep his sons and daughters on the farm he must not lengthen the hours for a day's work at both ends. Limit the hours of work on the farm to twelve or thirteen with pay for overtime, and freedom to the hired man on Sunday."

The Country Life Commission welcomes letters like this, because as Professor L. H. Bailey, Chairman of the Commission, recently pointed out, one of the objects of the investigations of the Commission will be to obtain, as fully as possible, the opinions of both farmers and of their hands concerning the question of farm labor and the condition of hired help. It is likely that when the Country Life Commission reaches Indiana in the tour of the country which it will make early next month it will endeavor to get into personal touch with this letter writer.

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**BAD EGGS AND POULTRY**

To Whom it May Concern:

The attention of producers and dealers in eggs and poultry is called to the provisions of clause 8 of section 9 of the food laws as follows:

"If it consists wholly or in part of a diseased, decomposed, filthy or putrid animal or vegetable substance, or if such substance or substances be used in the preparation thereof, or if it is the product of a diseased animal, or one that has

died otherwise than by slaughter." The same shall be deemed to be adulterated within the meaning of the Law.

Parties violating the provisions of this law are liable to a fine of twenty-five to one hundred dollars and all necessary costs. By order of the Court such products may be seized and destroyed.

All producers are warned not to offer eggs or poultry for sale which are not fresh and wholesome and all dealers, who buy or deal in stale or rotten eggs and decomposed or tainted poultry will

be prosecuted to the full extent of the law.

From this time on dealers in the above mentioned articles of food will be prosecuted wherever evidence can be obtained.

(Signed) E. F. LADD, Com.

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Well ripened clover Honey for Sale, guaranteed absolutely pure and of the finest quality. One 30-lb. can 11 1/2¢ per lb.; 2 or more cans 11¢; 12-lb. cans, in full cases of 72 lbs., 11 1/2¢ per lb. Send for price list. Address  
M. V. FACEY, Preston, Fillmore Co., Minn.

## Livestock Department

PROF. W. B. RICHARDS, Editor

### THE RELATION OF TYPE TO BREED

Prof. T. L. Haecker has the following to say on the subject in the Farm, Stock and Home.

"One of the important lessons taught by the remarkable demonstrations and revelations of recent years regarding cow feeding and milk production is the amazing effect of the conformation of the animal upon production and the cost thereof. These revelations lead to the reasonable conclusion that conformation of the animal, and not the breed to which it belongs is the most important factor in producing meats of all kinds at the lowest cost.

Of course it has been held for many years that certain breeds of cattle or hogs are the most profitable meat producers by reason of their conformation or type, fallaciously supposed to be common to all individuals of a given breed. But recent close and comprehensive scientific work with cows of all breeds has demonstrated that as great a range of profitableness has been found in individuals of the same breed as in individuals of different breeds. Thus it has been proven that so far as cows are concerned type and not breed is the essential thing to secure in a herd; and if so with milk producing animals why not with meat producing animals?

Now this should not lead to the conclusion that breed is of no consequence. A breed of cattle, for instance, has been bred in line so long that qualities in the members of it will be reproduced in their issue in larger proportion than if the breeding in line had not been practiced. But it should be ever remembered that all the issue of the purest blooded animals will not be of the same type as their sires and dams. Variation is the rule, because rever-

sion to original types is nature's protest against interference with her creations.

Breed is valuable because a larger percentage of its issue will be true to type; and type is the chief factor in profit making in meat production as it has been proven to be in milk and cream production. But the percentage of issue, small or large, which is not true to the type of its worthy ancestors should not be allowed to grow up to be used in reproduction. The breed will cut no figure if the type or conformation of the animal differs materially from that of the best of its ancestors. Failure to give effect to this dictum accounts for the tremendous variation in performance of individuals of the same breed; a difference, as has been stated, often greater than in individuals of different breeds.

Until the art of how to select for breeding purposes only the worthy specimens from pure bred stock is learned, and until rejection of the unworthy for breeding purposes becomes the invariable rule, marked improvement in the cattle of the country will be a hope unrealized. Beef cattle men, as a rule, have no use for dairy cattle, but demonstrations made with dairy cattle have revealed things of vital importance to beef cattle breeders, and self interest alone should move them to give the revelations the attention they deserve."

### TRUE TYPE OF THE HOLSTEIN

F. L. Houghton, Sec'y Holstein-Friesian Association

Considerable public comment appearing in the agricultural papers upon the type of Holstein-Friesian cattle is very

properly directing attention to the subject of the true type of the breed.

The breeder, who, for one moment in his pursuit of higher fat percentage in the milk, forgets type, is doing incalculable damage to the future of the breed.

The true type of the breed is very accurately delineated in the scale of points. It is to be regretted that illustrations of typical specimens are not used to illustrate and emphasize this description.

Change of environment of this breed from the low lands of Holland is doubtless effecting a very slight change in the bony structure of the Holstein, tending toward a greater finish or refinement. Aside from this natural process, it is very doubtful whether any improvement can be made or should be attempted. The Holland type is the result of centuries of selection and environment, and it has distinguished these cattle in all parts of the world. With it has come the marvelous and profitable production or yield, the characteristic tendencies of powerful digestion and perfect assimilation of food. These characteristics, derived from the Holstein, have been important factors in the foundation stock of the Shorthorn and Ayrshire breeds, and of many of the Continental offshoots.

In America it was the Holland type that by its productive power directed the attention of agriculturists towards this breed, and it is safe to assert that an examination of the great majority of remarkable yields will show, to those having means of access to photographs or descriptions, the close adherence to the Holland type in all these wonderful animals. Large size in the Holstein is the first thing to impress the casual observer, and its importance should never be disregarded.

In defining pure bred Holstein cattle, this fact was duly set forth by the founders of the Herd-Book Association, in these words, which should never be forgotten, no matter what may be the yield in milk or its fat percentage, viz.: "Pure bred Holstein-Friesian shall be held to mean and refer to only those large, improved black and white cattle, etc." (Art. 4, Sec. 5, By-Laws of H. F. A. of A.



Scientific investigation in this country, particularly in Wisconsin, has confirmed the wisdom of the early breeders in thus defining the type of the breed as "large," for the large cow of any breed is uniformly the more profitable.

An idea of the size of animals of this breed, at the time of Mr. Chenery's first importations, may be gained from the following quotation (Vol. 2, Holstein H. B., folio 19):

"The bull, Van Tromp (see portrait), imported in the womb of Texelaar, is now six years old, and his girth is 8 feet, 5 inches; length, 9 feet, 2 inches; height, 5 feet, 2 inches; weight, 2,720 pounds; and the weight of the two-years-old bull, Opperdoes 7th, is 1,597 pounds. The weight of the imported cow, Texelaar (see portrait), is 1,560 pounds; Lady Midwoud (see portrait), 1,620

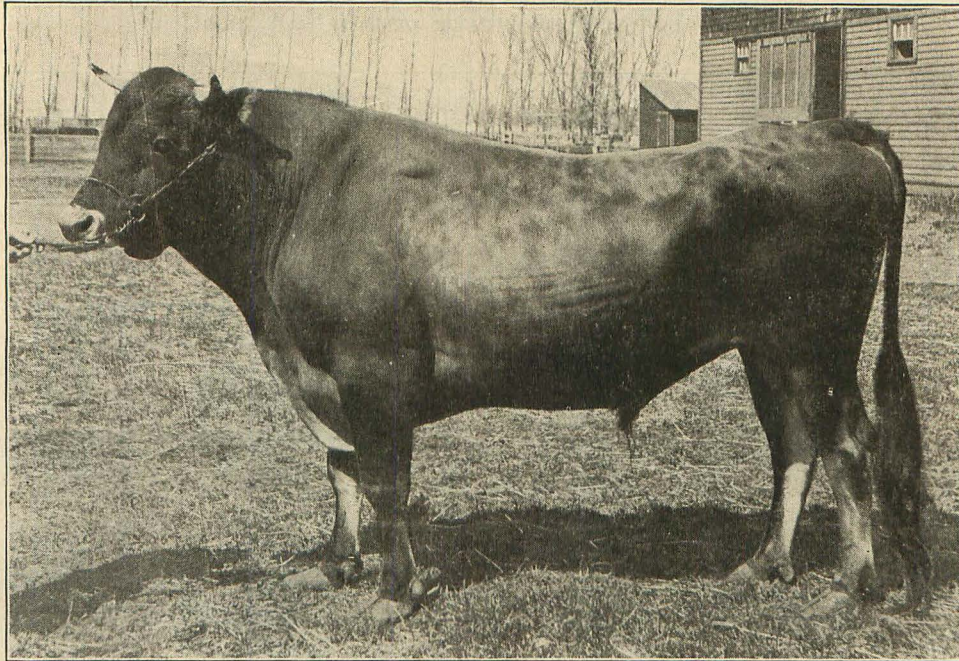
ty-seven surpass the 1400 pound mark. Only nine weigh less than 1200 pounds, and the average weight of the whole number is 1383 pounds," etc. "Of the twenty-five bulls, not one weighs less than 1800 pounds and only five less than 2000 pounds. Only three weigh more than 2400 pounds, and the average weight of the whole number is 2164 lbs."

Mr. S. Hoxie, in the pamphlet, "Holstein-Friesian Cattle," (1905) writing upon the size of cows, states, "In ordinary milking condition at full age, they range in weight from 1000 to 1500 pounds."

With large size as the recognized predominant characteristic of the breed, aside from their beautiful black and white color markings in perfectly defined patches or spots, the next general definition relates to the general confor-

more compact than in the milk form, but of lighter weight than in the beef form. The brisket is not so wide and low as in the beef form, and the chest is not so deep, but the width of the beef form thru at the heart is closely retained. In the milk form the abdomen is usually swung low, and the ribs are steep, but in the milk and beef form the ribs are wider sprung and the abdomen more trimly help up tho no less capacious. The general appearance of the bull is strongly masculine, but that of the cow is no less feminine than in the milk form."

It may be further emphasized, that the milk and beef form, describes a cow of the wedge form, with shoulders moderately thick, deep and broad, crops well filled, barrel well rounded, loin and hips broad and full, and quarters straight, wide and full.



Jersey Bull, "Prairie Czar," 68457. Owned by the North Dakota Agricultural College.

pounds; the four-years-old heifer, Opperdoes 3rd (see portrait), 1,495 pounds; the three-years-old heifer, Texelaar 5th, 1,500 pounds; the two-years-old heifer, Texelaar 8th, 1,290 pounds; the yearling heifer, Zuider Zee 5th, 900 pounds; the bull-calf, Duke of Belmont, nine months old, 710 pounds, and the heifer calf, Midwoud 8th, nine months old, 635 pounds; all raised in the ordinary way, without forcing; the young animals running in pasture from May until November."

Burton W. Potter, in 1906, published the results of his investigations as to the weight of sixty large record cows, tested under the present Advanced Registry system, 1894 to 1906.

Mr. Potter summarizes thus: "Of the sixty cows, only thirteen weigh more than 1500 pounds each, and only twen-

ty-seven surpass the 1400 pound mark. Only nine weigh less than 1200 pounds, and the average weight of the whole number is 1383 pounds," etc.

The average form of this breed and that toward which conscientious breeders are directing their efforts to maintain and improve, is the milk and beef form.

Mr. S. Hoxie thus admirably refers to the milk and beef type of the breed: "It is especially strong in all vital particulars. The bones are fine compared with size, and the chine broad and strong compared with the high and sharp chine of the extreme milk form. The loin and hips are broad and smooth, and the rump high and level, compared with the angularity usually shown in the milk form. The twist is roomy and the thighs and hocks well apart. Passing forward the shoulders are smoother and

To this form of these cattle is due their extraordinary constitutional vigor or vital force, and it affects all their relations to their food, care and productions.

The milk and beef form is not accompanied with the angularity of appearance, the light shoulders and chest, and the comparatively light quarters of cattle of the milk form.

The future of the breed will be greatly endangered by those, who, from one consideration or another, the combination of pedigrees to attain large average records or fat percentages, or by neglect of proper feed and care in the early life of the animal, are led to the mating of animals of other than those of large size, and possessing the milk and beef form. Neither the breeds of the Channel Islands nor the Ayrshire breed possesses this form, even remotely.



## SHEEP ON THE GRAIN FARM

Read by Dugald Campbell, Kintyre, N. D. at the Annual Meeting of the North Dakota Live Stock Association.

The subject set aside for me was "Sheep on the Grain Farm," but, as I studied how best to present the case of the neglected sheep, I found that I was making of the grain a secondary consideration, and giving the pre-eminence to the sheep. Therefore I changed the subject and called it boldly as above, "Grain on the Sheep Farm." Last June in Mandan I talked to the farmers about the section sheep farm in western North Dakota. That was an effort towards encouraging the settlers, in fencing part of their prairie farms with a dog or wolf-proof fence, so as to enable the home builder to have the constant and sure help of a few hundred sheep, while his part of the country was passing thru the transition period from the open

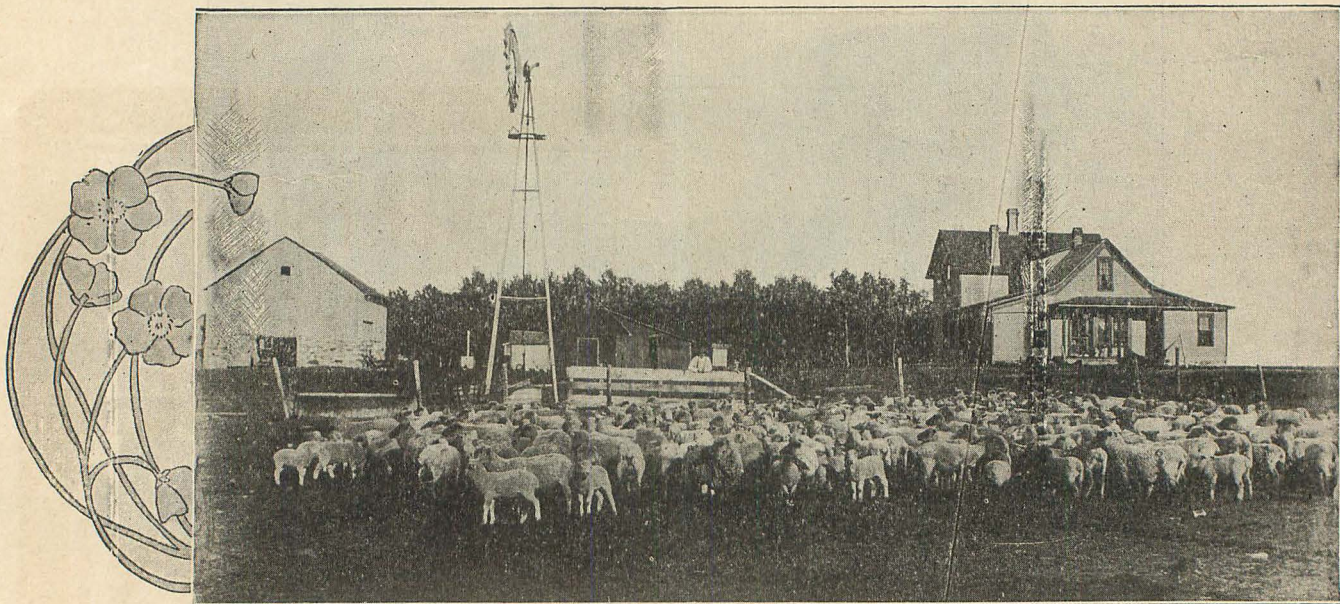
summation surely to be devoutly wished for.

Naturally, I am better acquainted with conditions further west, but, for the last twenty-six years I am no stranger in the Valley. During that time I have traveled by rail and by team in almost every state in the Union, and always with the wide open eye and the receptive ear of the farmer born and bred; and if now I decided I had to live by the plough, I would come to the Valley and buy a farm, and if I could not buy one, I would rent one. But if the farm were my own, the first money I had to spare would go into a fence and a few sheep.

For several years I have assisted in handling many thousands of sheep in Cass county, and know that it is perfectly feasible to turn many of the valley farms into successful sheep farms, with grain as a profitable adjunct.

Most likely, only a few men will try sheep and grain-growing together, but I

The next most successful sheep in our show rings come from the sheep and grain farms of Ontario, Canada. The supremacy of Canadian fed sheep and lambs in the Buffalo and New York markets is due to the facts that they are raised where crop rotation is practised, and where grass that is not allowed to become old or foul occupies a prominent place in that rotation. Here, in North Dakota, on account of the expense of handling root crops, and the greater extremes of our climate, we can never expect to compete with England or Canada in the breeding of fancy sheep to sell at fancy prices. But, with the variety of our grain and forage crops and the comparative cheapness with which they can be raised, we can certainly engage successfully in the raising of fat mutton for the market. The bracing, healthful climate we have here is also a favorable factor in the production of commercial mutton.



"I found that I was making of the grain a secondary consideration, and giving the pre-eminence to the Sheep."

range to the confinement of laid-out section lines. The suggestions made there were meant particularly to apply to the country in our state lying west of the 100th meridian, where the natural grasses still retain much of their original rich and nutritive qualities. Here, in the Red River Valley, and as far west as the James River, the pioneer time of breaking up the raw prairie and taking the cream off it with continuous grain growing is already at an end, and we may as well face the situation.

If any of you are painfully aware that in spite of all you can do, you cannot get the average yields you formerly got, perhaps you will follow me while I try merely to outline a plan, whereby some of you can show again the former big averages of grain, and at the same time have less of hard work and hired help,—a con-

confidently predict that those who handle the sheep intelligently will be on "Easy Street" ahead of those who pin their faith on grain alone.

It is possible to figure out greater profits on so many more acres under grain, but the probable profits on a sheep and grain farm are greater, and much more likely to be realized. Those of you who have traveled thru England and the Lowlands of Scotland will have noticed that many of the most prosperous looking farming districts are given over entirely to sheep and grain farms combined. That is where an ordinary yield of wheat is forty bushels to the acre, and also where we people of the United States get the bulk of our prize-winning Shropshire, Oxford, Hampshire, South-down and Cotswold sheep from.

If the grain-growing conditions were the same now as in the eighties, sheep or cattle would not be taken into consideration. However, the wonderful soil has not lost its fertility. Science has proven beyond question that it is impossible to destroy the natural fertility of soil. It may, thru maltreatment, cease, to raise crops, but will retain its fertility, to again become active under proper treatment. Those men who have made a life study of soils and animals are practically agreed that the sheep is the animal par-excellence to assist the willing farmer in renovating the wearied-out soil.

We have often seen a strong, busy man fail rapidly, while doctors or medicine were of no avail. He seeks a change of climate and conditions, and often becomes as well as ever. He had simply



worn himself and the climate out, and required a change of air and environment to oil up the wheels of life again.

Some of your soil is flax sick, and most of it is grain sick and tired. Why not give it a change and rest, and especially when by using the sheep, you also will have a variety of interest, and will always have on hand a lot of willing helpers, that will not leave you in a tight place, and will faithfully pay their board bill twice a year, and that with big interest added?

Now, then: If you are interested in this sheep farm, we will go ahead, and in two years get one-half of the section into tame grass, and divided by fences into two pastures of 160 acres each. In seeding down, it will be wise to notice what others have done on the same kind of soil, and to study all the college reports bearing on the subject. On the drier lands, I would be in favor of Brome grass by itself, and of white clover and timothy sown together. On the moister lands, where the drainage is not good, alsike clover and red top should decidedly have the preference.

A good and sufficient dog-proof fence can be made with 28-inch woven wire. One barbed wire below, and one above. Your fence does not require to be as high as a fence to keep out or in range cattle. The three and half miles will cost from \$600 to \$700. It is expensive, but remember that the five horse team, harness and gang plow you can now sell, will pay for the fence and the labor. Better not keep the land in grass more than three years, and there will be no time for the disease germs hurtful to sheep to get a hold in the pastures. When required, the changing of three sides of one pasture will not be an expensive job, especially if the large straining posts are left standing. Professor Thomas Shaw's idea of cement posts will be the final solution of the fence-post problem on our treeless prairies.

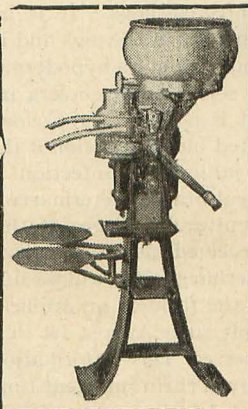
On these pastures it is advisable to stock light at first, until the capabilities of the grass have been tested. Say 500 ewes to begin with. By all means buy your sheep in the West, and leave the eastern sheep alone. For many sheep generations now, the breeders of Montana, Washington and Oregon have been working intelligently under the laws of selection, to fit the sheep for their rugged and primitive environment; while Nature herself has seen to it that no serious mistakes are made, for, like a Spartan mother, she destroyed the weaklings of the flock before they had time to reproduce themselves.

Bringing them to your fenced pastures, they will assuredly feel that they are "in clover," and in a few generations they will wax fat and lazy, and then will be a good time to market and go out after more westerners.

If you are buying in the spring time, a good place to go to is out to the alfalfa feeding farms in Montana, and buy yearlings, that the owners often do not wish to send back onto the open range. If buying in the fall, give yearling ewes the preference over mixed bands, and then there is no guess-work about their ages, and there will be no old ewes to turn off, for at least five years. If there is no one you know and can depend on to assist you in buying, go to the banker at the nearest town. He always knows who has sheep for sale, and often it is to his interest to see a sale made. One need not be afraid of buying sheep affected with scab. The federal and state authorities will protect you in spite of yourself.

When the sheep have been landed on the farm, the tame grass will feed them, and the fence will herd them from April to November, without labor on your part, except to take a look at them, or a stroll thru them, morning and evening. To winter 500 ewes will require a shed

80x28, but to lamb them in it is better to have the shed at least 100x28 feet. Whoever cares for your horses in the winter months will only consider it as light exercise to feed and water 500 sheep. The ewes should lamb in March, so as to have that work over before seeding begins in April. Then, more work and close attention is required for about a month. There is no freemasonry secret involved in caring for sheep successfully, either at lambing or any other time. Ordinary common sense and a desire to learn, coupled with a natural aversion to laziness and cruelty will insure a measure of good fortune with them, as with any other good fortune with them, as with any other live stock. To winter those 500 ewes, so as to have them in nice condition (not fat) at lambing time will require the crop off about 70 acres of corn, or, better still, of corn and red clover. Wheat straw will keep them from being very hungry, but rye or oat straw make much better roughage. Flax straw is good as an occasional change. One ra-



## EVERYBODY BUYING DE LAVAL CREAM

# SEPARATORS

The wonderful improvements made in the 1908 DE LAVAL CREAM SEPARATORS—added to their THIRTY YEARS record of ONE MILLION prosperous users throughout the world—have convinced practically all WELL-INFORMED buyers of their overwhelming superiority, as well as actual cheapness, and they are being bought in even greater proportion this fall than in the spring or ever before.

A catalogue to be had for the asking shows the reasons WHY.

### THE DE LAVAL SEPARATOR CO.

42 E. MADISON STREET  
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MONTREAL  
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107 FIRST STREET  
PORTLAND, OREG.



tion per day of corn that had been bound in the ear, before the frost was too hard, will be enough until two or three weeks before the lambs are due. From that time until they can get on the pastures they should get two feeds a day, and then is the time that the red clover will tell. A few words now in the way of comparison.

Supposing that there are 120 acres in feed and forage crops for the sheep, horses and milk cows. That leaves 200 acres to raise grain for the market. Under the present system there are about 500 acres to the section in marketable crops. The present net profit will run about \$2,000 to \$2,500. But the average yield is on the decline. Under the crop rotation and animal husbandry system the net profit on the 200 acres should be from \$1,200 upwards. The 500 ewes should gross \$2,200, or either the management or the market is terribly bad. Deducting from that \$40 for shearing, the cost of extra help at lambing, interest on money in sheep and shed, and actual cost of corn and clover, the sheep would still show a net profit of some \$1,800. Otherwise you have increased the net income from the farm from \$500 to \$1,000 per annum. Your land has increased in productiveness and in value, and you and your wife have laid aside one-half of the burden of hired help and machinery.

I can imagine I hear some one say: "But, supposing that we should have a failure of our corn and red clover with the sheep on our hands the latter part of summer?" That is very unlikely to happen, as even frosted corn makes very good feed for stock sheep. But granted that it does. There will be plenty of stubble all around. As early in September as there will be stubble space to graze them in, take the sheep and the lambs out the pasture altogether in the morning. Let them roam out to pasture all together in the morning. Let them roam over the stubble fields all day, and put them back into the pasture at night, without corralling them.

Later in the season, if there is any corn at all, let them harvest it themselves. Before winter sets in the most of them will be fat for the market, and those that will not sell for killers, will sell at the top price for feeders. Then, when you dispose of them in Chicago, you can go to Florida for the winter and return in time to go out to the alfalfa ranches for a fresh lot of sheep in spring, before seeding begins.

By the time you have traveled from Florida to Montana, and back again to your own comfortable farm home, observing the difficulties that every one has to contend with, and noticing the problems that each district is laboriously trying to solve, methinks you will be willing—like Samuel of old—to raise a

stone of Ebenezer testifying to your grateful contentment with the land of your adoption.

#### IMMUNIZATION FOR HOG CHOLERA AN ACCOMPLISHED FACT

In the last issue mention was made of the prevalence of hog cholera in the state and the loss that it is going to cause the farmers of the state in the communities where the outbreaks have occurred or are likely to occur. No mention, however, was made of the fact that a method of immunizing swine against the disease had been discovered recently. The task has been accomplished by Drs. Dorset, McBride and Niles of the U. S. Department of Agriculture after spending 14 years at the endeavor. The time, however, has been well spent in view of the fact of what this will mean in saving a loss to the farmers of this country.

The immunization is accomplished by a hyper-immune blood serum obtained from immune pigs that have been made hyper-immune by the infection of blood from cholera infected hogs. It is injected hypodermically in the pigs and in addition they must receive a hypodermic inject of blood serum from cholera infected hogs. It is not necessary, how to use the infected blood injection if the hogs have been subjected to infection.

The Experiment Station veterinarians at all the Agricultural Colleges of this country have received instructions how to prepare the serum so they will be able to supply it to the farmers on application. It was only since August 1st that they have received this information which has not given them sufficient time to prepare much of the serum, for it takes considerable time to make it and the process is somewhat expensive.

Dr. L. VanEs of the North Dakota Experiment Station is making the serum, but has been unable to supply the demand for it on account of the amount of cholera that exists in the state and the limited facilities at his disposal for making it. The serum is being sup-

## AUCTION SALE OF PURE BRED CATTLE

The Undersigned Will sell at Auction, to the highest bidder,

**SATURDAY, OCTOBER 31, 1908**

Thirty-five (35) head of Aberdeen-Angus Cattle from the Celebrated

**BONNIE BRAE HERD**

The sale will take place at the stock barns, in Valley City, N. D. The cattle included in this sale are the best ever offered at auction in the Dakotas. Included are a number of the prize-winning show herd, the imported herd bull, about twenty cows and heifers, many of them with calf at foot, several young bulls from ten months to two years old; all in fine condition and well bred.

Beef prices are high, and this is the time to purchase pure bred cattle. Cattle are offered without reserve, and prices are likely to rule low.

**Railway fare to Valley City will be refunded** to all whose purchases amount to \$300.00, or more.

Full list of cattle will be mailed upon application.

Sale time, 1:00 P. M.

Auctioneer, Co. Frank Hyland,  
Devils Lake, N. D.

**GEO. A. McFARLAND, Prop.,**  
Valley City, North Dakota.

## Clover Hill Shorthorns

Young cows, heifers and bulls for sale. Herd headed by Imp. Ben Lomond 224418. Prices reasonable. **Jas. O'Hara, Lanesboro, Minn.**

## For Sale Shropshire Rams and Ewes

I have shipped in from Wisconsin

**A CHOICE LOT OF YEARLING RAMS AND EWES.**

**PRICES REASONABLE.**

**Address.**

**W. B. RICHARDS,**

Agricultural College,

North Dakota.



plied only to those who report an outbreak in their herd. This is because it will be the means of saving the herd where the disease breaks out. If it was furnished to inoculate herds that have not been infected the chances are that they may not be exposed to the disease and the serum would be as well as wasted. If there was plenty of serum to be had there would be no objection to furnishing it to all whom might apply for it.

The writer last fall warned the farmers of this state not to sell their stock, because of the existing high price of grain. This was done because it was known that not only stock was rushed to market without condition, but the breeding stock, the seed for this year's crop and possibly several future crops of animals was sold in many cases. The result of this action means that many farmers have no pig crop this year for it was the hogs that were most generally sacrificed last fall, because of the high price of barley. No doubt many have raised less calves this year because they reduced their cattle breeding stock to the minimum number.

The writer also made the prediction last fall that many would look back this year with regret upon their actions for the reason that barley would likely be selling at a price this year, which would net a better price if fed to swine. The prediction was also made that pork would be higher this year as a result of the conditions that existed last year. This is the case; for hogs are selling at higher prices and promise to keep up in price for some time. This being the case barley fed to hogs this fall will net a better price than if sold at the elevator. The fellow, however, who sold all his hogs last fall has none to feed this year and can not take advantage of this possibility and neither will he be able to reap the returns from growing the pig crop which would not cost him practically anything in the way of expensive feed.

It is a well known fact that the farmers in the newly settled portions of this state in particular and in other portions not so newly settled, whenever they get a succession of good crops sell off all their stock. They make the claim that there is no money in raising them compared with grain.

They fail, however, to take cognizance of the fact that grain raising may not continue its rosy aspect as it has in the immediate future; nor of the fact that the soil is going to deminish in fertility as each succeeding crop is removed from it unless some fertility is added to it in the way of barn yard manure. In the persuance of this kind of a policy there is no evidence that there is any heed taken of the welfare of posterity nor of

the welfare of their children who will succeed them on these farms.

There is no proof required nor any necessity for an argument, to be convinced of the fact, that the returns received from the farms of this state during the average time of occupancy by our farmers would be greater of diversification was practiced continuously in preference to grain growing. The returns not only would be greater but much more pleasure and satisfaction would be reaped by the land holder. It is to be hoped that more will recognize this fact and turn there attention immediately to combining live stock production with grain growing rather than to wait to be forced into doing it by virtue of a failure to continue to make exclusively grain growing profitable.

## TREATING SICK ANIMALS

By Dr. David Roberts, Wisconsin State Veterinarian

### Stoppage of the Bowels in Cattle

This is one of the most common ailments that cattle are subject to; at the same time more cattle die from this cause than any other for the simple reason that stoppage is due to paralysis of the bowels.

Stoppage of the bowels is to be regarded as a sign of another disease rather than a disease of itself. It occurs in almost all fevers, indigestion and over-eating.

## REPORT OF THE ST. PAUL UNION STOCKYARDS COMPANY

### RECEIPTS

	Cattle	Calves	Hogs	Sheep	Horses	Tot. Cars
C. R. I. & P....	364	6	353	440	....	20
C. G. W.....	621	87	2256	945	....	64
C. M. & St. P....	7539	806	5475	9500	140	428
M. & St. L.....	849	147	2725	434	51	75
C. St. P. M. & O	2275	395	10817	7037	40	269
C. B. & Q.....	221	61	764	731	....	26
Wis. Cent.....	279	28	1037	276	....	25
St. P. & S. S. M	10858	1423	5111	3818	....	486
Gt. Nor.....	19408	2015	9324	20026	267	979
Nor. Pac.....	17540	1586	3441	13476	209	796
Driven in.....	528	51	559	153	....	....
Total .....	60482	6605	41862	56836	707	3168
Total Last Yr.	109470	8837	30943	124066	3170	5641

### SHIPMENTS

	Cattle	Calves	Hogs	Sheep	Horses	Tot. Cars
C. R. I. & P....	3294	.....	.....	2389	....	110
C. G. W.....	7375	244	129	2704	....	288
C. M. & St. P....	4811	512	9	15139	214	267
M. & St. L.....	1428	12	.....	4661	....	83
C. S. P. M. & O.	10472	259	385	11771	59	432
C. B. & Q.....	18789	203	.....	5879	328	742
Wis. Cent.....	.....	.....	.....	2563	54	12
M. S. P. & S. S. M.	384	55	.....	2086	.....	28
Gt. Nor.....	80	69	.....	644	....	7
Nor. Pac.....	525	154	68	1184	44	31
Driven out....	1374	429	8	2361	20	....
Total .....	48532	1937	599	51381	719	2009
Total Last Yr.	91453	3136	222	108722	3016	4246

### Summary For 9 Months

RECEIPTS			SHIPMENTS		
	This Year	Last Year		This Year	Last Year
Cattle.....	257453	252884	Cattle.....	188865	188108
Calves.....	48081	46657	Calves.....	9101	10239
Hogs.....	751139	603828	Hogs.....	179493	16771
Sheep.....	211057	228212	Sheep.....	135708	197055
Horses.....	6262	12735	Horses.....	5898	12170
Cars.....	19892	19662	Cars.....	8294	8130



In order to overcome stoppage of the bowels a treatment must be applied to overcome the ailment which causes it, it, such as paralysis of the bowels. Seventy-five per cent of the cases of stoppage of the bowels are due to partial paralysis of the bowels. In this case the bowels require a laxative and tonic and not a physic, for if the bowels are paralyzed a physic will have a tendency to cause irritation, indigestion, inflammation, and death follows. For this reason it is dangerous to give a cow salts or oil.

A cow thus afflicted should be given a laxative and tonic, plenty of drinking water, with the chill taken from it, bran mashes made of flax seed tea, also inject several quarts of warm water once or twice daily thru the rectum by the use of the hose and funnel, and give the animal a reasonable amount of exercise.

#### Proper Method of Examining a Sick Animal

First take the temperature of the animal by placing a fever thermometer into the rectum, allowing it to remain there from three to five minutes. The normal temperature of a cow is 101 degrees (Fahrenheit). The normal temperature of a horse is 100 degrees, sheep 101 degrees.

Second, take the pulse of the animal, which can be found at the angle of the lower jaw bone. The normal beats of a cow's pulse are from forty to fifty per minute and that a horse from thirty-three to forty per minute.

Third, count the respiration of the animal, or number of times it breathes by watching the sides of flanks, or by pressing the ear to the side. The normal respiration of the cow is from fifteen to twenty per minute and that of a horse is from twelve to fifteen per minute while resting. If the temperature pulse or respirations are found to be higher or faster than above described, you will know that the animal is ailing.

#### REPORT COMMITTEE ON STATE LEGISLATION

Whereas tuberculosis is disseminated thru the interchange of cattle from one state to another, and whereas this fact has given rise to the enactment of laws in a few of the states, requiring a certificate to accompany all importations of dairy and breeding cattle, certifying that such cattle have been tested within a limited time and are free from tuberculosis. Therefore, be it

Resolved, That in order to obtain a general uniformity of laws pertaining to interstate shipments of cattle that the several states obtain legislation prohibiting the importation of dairy or breeding cattle into their several states,

except when such cattle are accompanied by a certificate, stating that such cattle have been examined and subjected to the tuberculin test within sixty days by a veterinarian whose competency and reliability are certified to by authorities charged with the control of domestic animals in the state from whence such cattle originate, and that such cattle are free from disease.

Whereas tuberculosis among cattle and swine exists to an alarming extent, be it.

Resolved, That the authorities of the various states recommend and encourage breeders and owners of dairy or breeding cattle to apply the tuberculin test.

Recognizing that bovine tuberculosis is most frequently transmitted thru the purchase of animals affected in the early stages of the disease, therefore be it

Resolved, that the respective legislatures enact laws requiring the tuberculin testing of breeding and dairy cattle, the ownership of which is transferred from one person to another.

Whereas it has been demonstrated that tuberculosis is being transmitted to swine and calves thru the medium of creamery by-products, therefore be it

Resolved, That the several states recommend to their legislatures the enactment of a law requiring that every owner, manager, or operator of a creamery shall, before delivering to any person any skim milk or other by-product, cause the same to be pasteurized at a temperature of at least 185 degrees Fahrenheit.

Whereas it has been demonstrated that the milk from tuberculous cattle is a menace to human health, therefore be it

Resolved, That the authorities of the various states recommend and encourage every city, town or village in their several states to adopt an ordinance requiring the compulsory testing of all cattle supplying milk to the various cities, towns and villages, and the enactment of such other ordinances as will maintain the efficiency of such an ordinance.

#### Report Committee Municipal Legislation

In view of the fact that there is as yet no Federal or State regulation effectively enforced, it is highly desirable that municipalities enact an ordinance prohibiting the sale of milk and milk products, except from cows that have passed a negative tuberculin test within one year.

It is suggested that such an ordinance by the authorities charged with the control of food and dairy products in the various states, and by them submitted to the various local municipalities for adoption.

It is to be borne in mind that the enforcement of this ordinance will require the presence of inspectors in the field.

Your committee, not being conversant with the economic and legal conditions in the various municipalities, cannot submit a model ordinance.

## THE BEST LINIMENT

OR PAIN KILLER FOR THE HUMAN BODY

Gombault's

# Caustic Balsam

IT HAS NO EQUAL

**For the Human Body** —It is penetrating, soothing and healing, and for all Old Sores, Bruises, or Wounds, Felons, Exterior Cancers, Boils, Corns and Bunions. CAUSTIC BALSAM has no equal as a Liniment.

We would say to all who buy it that it does not contain a particle of poisonous substance and therefore no harm can result from its external use. Persistent, thorough use will cure many old or chronic ailments and it can be used on any case that requires an outward application with perfect safety.

**A Perfectly Safe and Reliable Remedy for**  
Sore Throat  
Chest Cold  
Backache  
Neuralgia  
Sprains  
Strains  
Lumbago  
Diphtheria  
Sore Lungs  
Rheumatism  
and  
all Stiff Joints

**REMOVES THE SORENESS—STRENGTHENS MUSCLES**  
Cornhill, Tex.—"One bottle Caustic Balsam did my rheumatism more good than \$120.00 paid in doctor's bills."  
OTTO A. BEYER.  
Price \$1.50 per bottle. Sold by druggists, or sent by us express prepaid. Write for Booklet R.  
The LAWRENCE-WILLIAMS COMPANY, Cleveland, O.

## LARGE YORKSHIRE

PIGS FOR SALE

T. A. HOVERSTAD, Fargo, N. D.

#### POLAND CHINAS

Herd Established in 1892. 150 head of the Big, Smooth kind that always pleases. Sired by Pilate Chief Iowa Dude and Black Delight. Mostly out of big litters from matured sows. I have had satisfied customers for the past ten years. I can furnish herd headers for breeders or farmers who raise pork for the market. Write me for prices and Illustrated Circular. Address, John Crowe, Dassel, Minn. Reference Bank of Dassel.

## FOR SALE

5 Angus Bulls  
10 Oxford Down Ram Lambs  
100 White Plymouth Rock Cockerels  
WILLOWBANK FARM  
Eastgate Bros., Larimore, N. D.

#### RIVERSIDE HERD OF HEREFORDS

Registered Herefords of either sex for sale at reasonable prices. Excellent breeding and good individuals.

HERMAN PFAENDER,

New Ulm, Minn.



**A FINANCIAL AND EDUCATIONAL FEATURE  
WORTHY OF CONSIDERATION BY  
THOSE INTERESTED IN  
DAIRYING**

One of the most important positions in a local creamery or cheese factory is that of manager or secretary. No matter how competent the butter or cheese maker may be or how good a product is made, the success of any creamery or cheese factory is largely dependent upon the man in charge of the financial affairs of the business. If the manager or secretary does not do his part the creamery or cheese factory, under his

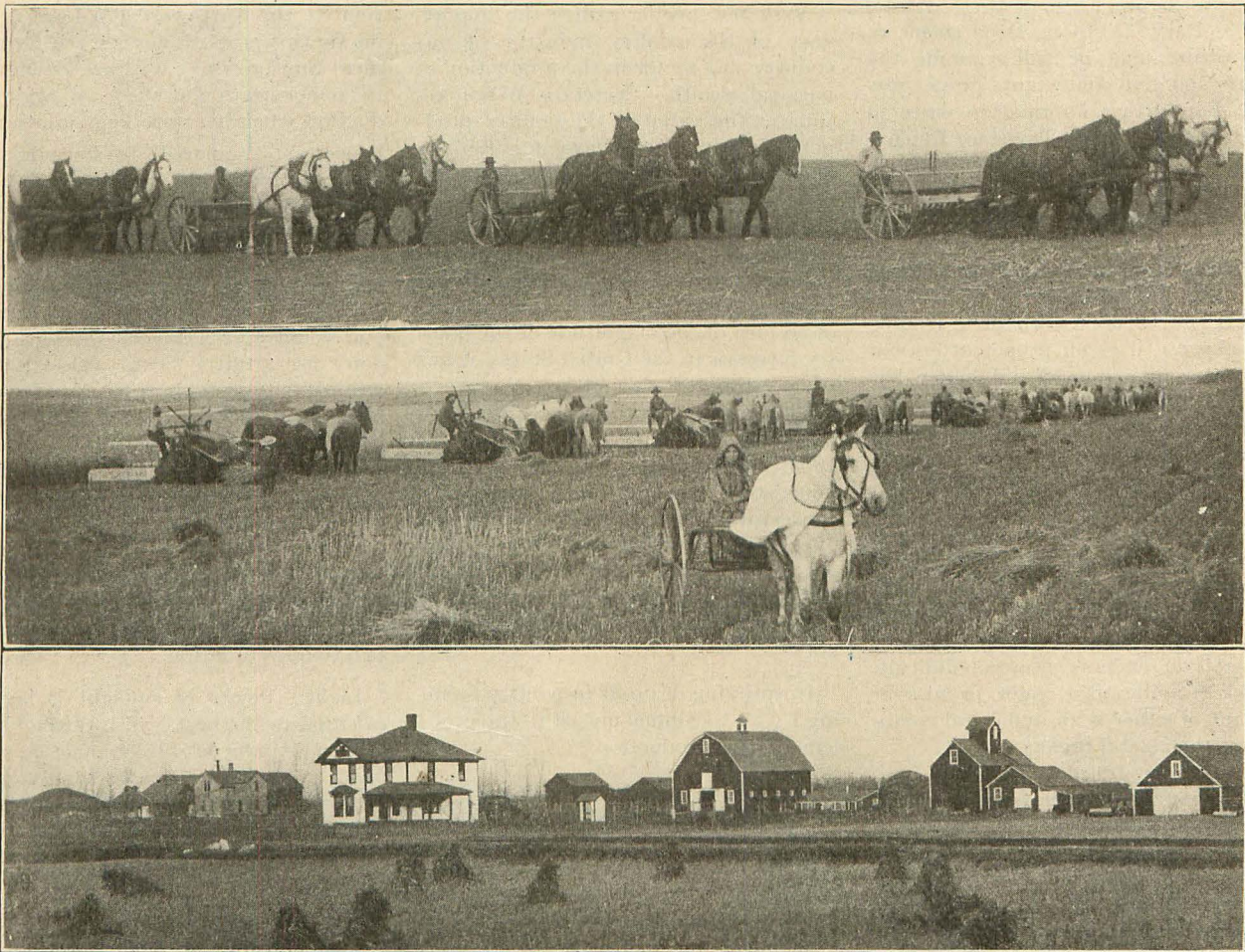
factories hold positions which are as important as that of any other person connected with the dairy business, and the success or failure of the creamery or cheese factory is in a large measure dependent upon them.

The National Dairy Show Association has placed at the disposal of the Dairy Division of the Department of Agriculture the sum of \$2,000 which will be divided pro rata among the managers and secretaries of creameries and cheese factories.

Those who may enter the contest:— Every manager or secretary of a creamery or cheese factory making not less

The statement of methods may also contain an explanation of how the business is conducted, such as the number of salaried men connected with the plant, their duties and what they are expected to accomplish. It may also be stated how the product is manufactured, marketed, etc., and new methods planned to improve the quality of the product or the economical operation of the plant.

Due allowance will be made for location. A creamery in North Dakota marketing its product in New York will stand the same chance as the creamery in Michigan or Pennsylvania and one



**Three Scenes Common in North Dakota.**

supervision, is seldom a success. Notwithstanding the importance of their position, the managers have never been considered in making up a program for the great dairy conventions, and they have never participated. As a consequence they have never attended any of the meetings which have afforded the buttermakers so many opportunities to compare notes with their fellow craftsmen and receive information which has assisted them in doing better work, thus making their services of more value to their employers.

It is recognized that the managers or secretaries of creameries and cheese

than 50,000 nor more than 500,000 pounds of butter per year and not less than 20,000 nor more than 200,000 pounds of cheese per year.

A butter or cheesemaker who is manager or secretary: A butter or cheesemaker who owns a creamery or cheese factory will also be classed as a manager or secretary.

Each contestant will write a statement consisting of not less than 200 nor more than 1000 words. The statement shall show how the business is managed; the kind of records kept, and those who wish may submit sample pages of the system of records they are keeping.

that makes 50,000 pounds of butter will be put on the same basis as the one making 500,000 pounds.

A secretary may write his report with a lead pencil and stand the same chance of getting as much of \$2,000, (other things being equal) as the one whose report is typewritten.

Full details in reference to this contest and blanks for reports, will be sent to creameries and cheese factories about November 1, 1908.

Every manager or secretary who receives a rating of 70, out of the possible 100 points, will receive a share of the pro rata of \$2,000, and for every



point above 70 he will receive an extra share of the pro rata fund.

The following points will be considered:—

Statement of methods used.....	15
Completeness of report.....	5
Completeness of report.....	10
Accuracy of report.....	5
Increase of business.....	5
Economical operation.....	10
Quantity of product (overrun).....	10
Quality of product (price received).....	20
Net results to patrons (price paid per pound of butterfats).....	40

Total.....100

The Managers and Secretaries program will be in charge of B. D. White, of the Dairy Division, Department of Agriculture, and he will examine the papers and give contestants proper rating. For further information write to B. D. White, Dairy Division, Department of Agriculture, Washington, D. C.

### LIVESTOCK NOTES

#### All Barren Cows and Heifers Can be Made to Breed

This can be done with little trouble and expense if given proper attention. Many a valuable cow and heifer has been sacrificed or disposed of for the reason that she was not made to breed. This may have been due to a lack of proper knowledge along this line.

It is very important that a cow, in order to conceive, be in a reasonable healthy condition. The genital organs should be in a condition to perform their functional duties as nature would have them. A lack of secretion or an excess of secretion, renders conception difficult. A lack of ambition or vigor, or an over amount of either is an unnatural condition of the genital organs.

A cow before breeding should be carefully noticed to make sure that there is no unnatural discharge from the vulva. An unnatural discharge would be a discharge of mucus that has every appearance of the white of an egg and at the period of heat usually contains a little blood.

## CLASSIFIED ADS.

### HORSES

#### FOR SALE

Registered Percheron horses and shorthorn cattle. STERN BROTHERS, Fargo, N. D.

### CATTLE

North Branch Stock Farm. High class Shorthorns. Herd, bull, Supreme Judge 177722—pure Scotch, John Donnelly, Grafton, N. D.

### MISCELLANEOUS

ENVILLA STOCK FARM  
Highest Quality of Animals and fowls. L. H. White, Prop., Cogswell, N. D.

## Poultry Department

### PROFITABLE POULTRY RAISING FOR THE NORTH DAKOTA FARMER

By O. W. Dynes, Delivered before Tri-State Grain and Stock Growers' Convention, Fargo, 1908

Very few people realize the importance of the poultry industry of our country as a factor in the production of national wealth. Secretary Wilson estimates the value of the poultry products of the United States for 1907 at \$600,000,000. This is greater than the total value of the lumber production of our country, \$100,000,000 more than the wheat crop and over three times the value of the total dairy products during the same year. To give you something of an idea of the magnitude of the poultry interests in the United States, it has been estimated that it would take a freight train of ordinary cars, 1,060 miles in length to carry the egg crop of 1905. Restricting ourselves to our home state it surprises us to find that a conservative estimate of the farm value of eggs and poultry during the year 1905 was over \$2,000,000. This sum is sufficiently large to pay one-fourth of the yearly farm help bill of North Dakota.

In speaking of profit in poultry farming I wish to confine myself to the problem of egg production.

In my discussion, therefore, I will leave out of consideration the growing of marketable poultry and raising fowls for exhibition and breeding purposes, thus limiting myself to the field of egg production. That there is room for improvement in increased egg yields among the poultry flocks of North Dakota cannot be questioned. The average North Dakota hen lays about sixty eggs a year. A knowledge of the means to increase that yearly average should be the aim of every poultry raiser. This past year the poorest laying hen in a pen of 20 birds at the North Dakota Experiment Station laid 73 eggs in 365 consecutive days. The hen with the highest record in the same pen had 214 eggs to her credit. This example is cited simply to show the possibilities of careful selection, and if in addition the North Dakota hen is given the right kind of feed and proper care and management, a large increase in her yearly record would undoubtedly follow.

Successful egg production with the poultrykeeper is largely dependent on four main factors: i. e., 1st. Housing; 2nd, Feeding; 3rd, The Stock; 4th, General Management.

### Housing

Kind of House Recommended: No one style of poultry house can be recommended as best for our climatic conditions in the Northwest. We are working on this problem now on the Experiment Station where we have attempted to demonstrate the effect on egg production when hens are kept in a warm house as compared to hens housed in a relatively cold building. The results are not yet for publication but our experience has shown that warmly built poultry houses are not essential to good egg production. If you are building a poultry house don't build it as warm as you would your cattle or horse barn and don't use artificial heat. Select a well drained site on which to build your house with a south exposure to the pens. Give your birds approximately about 5 sq. ft. of floor space and 30 cubic feet of airspace per fowl. The style of architecture which you use is not a material consideration if the three cardinal principles of successful poultry housing are well understood. These are: 1st, Adequate light; 2nd, Proper temperature; 3rd, Good ventilation.

Light. Plenty of sunlight is highly essential to the best health of the fowls and an abundance of this should be supplied. One square foot of windowlight to 10 sq. ft. of floor space is a safe rule to follow. Sunlight seems to act as a tonic to fowls in winter quarters and proves a great stimulant to the production of eggs.

Temperature. A wide variation in the temperature of the poultry house should be avoided. On sunny days the temperature will rise quite markedly and this is likely to prove detrimental to the best health of the fowls. At the Experiment Station we have found that a temperature of about 40 degrees Fahrenheit during the day gave the best results while at night it is allowed to drop to the freezing point. The temperature of the house is largely adjusted by means

## 45 BREEDS

Pure-bred Chickens, Ducks, Geese, Turkeys, Incubators, Supplies, and Collie Dogs. Send 4c for large Poultry book, Incubator Catalog, and Price list. H. H. HINKER, Dept. Mankato, Minn.





of the windows, the regular ventilators proving inadequate for that purpose.

Ventilation. Fresh air is more important than warmth in the poultry house. Warm, ill-ventilated houses produce enervation in the fowls and a consequent lack of egg production. No system of ventilation will be found satisfactory in a frost proof hen house without the use of the windows as an aid. The windows should be so constructed that they can be easily opened, especially during sunny days or the milder nights of winter. Cold drafts must be avoided, however. The use of a cloth

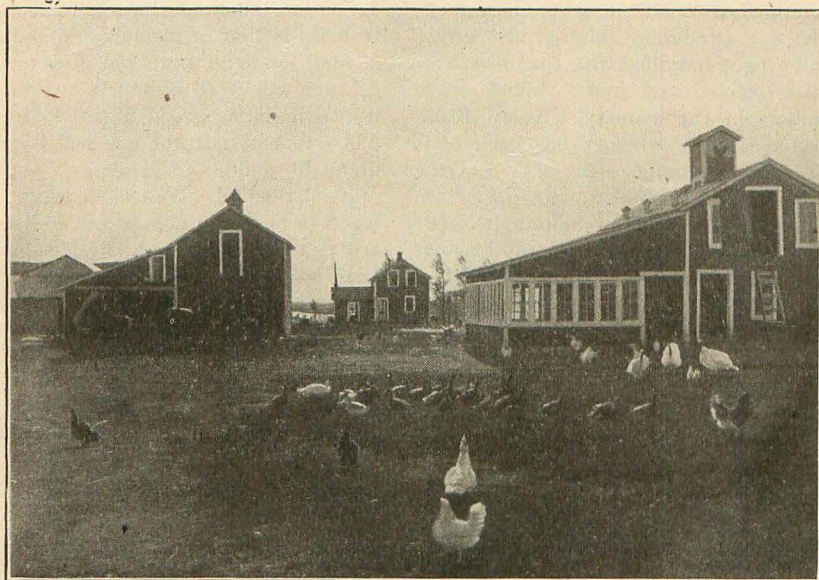
feed, leaving cost out of consideration, we have, as it contains the nutrients in a better balanced form than the other grains. In wheat raising districts it can well form one-half the daily ration of the hens. Corn is next in value and importance as a food for poultry. It is a cheaper feed than wheat but it is too fattening unless fed with some care. It should be ground or cracked for chicks but can be fed whole to older birds. Fowls do not take readily to oats but it makes a very desirable food if fed as a supplement to corn. Barley is not as palatable a grain for hens as the grains

range and plenty of green food. The poultry keeper should aim to surround them with summer conditions as far as possible in the winter months. While perhaps he cannot allow them free range he may at least supply in limited quantities the green food which the hen craves and which it must have if the best results are obtained. Clipped lawn grass or short-cut alfalfa, steamed and fed alone or with a mash will be found very satisfactory. Any of the vegetables, such as cabbage, turnips, beets or mangolds, fowls will eat with great relish. By a liberal use of green food the poultryman can duplicate in a measure summer conditions for his flock of fowls.

How to feed. The plan of feeding laying hens on the station poultry plant is substantially as follows: in the morning whole wheat is fed in the deep litter on the floor of the pens; at noon a mixture consisting of one part each of bran, shorts or middlings, corn meal, linseed meal and beef scraps is fed in the form of a mash. The green food, which has previously been steamed with hot water, is mixed with the mash and also fed. At night the feed consists of oats and corn fed in the pen litter as in the morning.

How much to feed. No absolute rule can be laid down as to the amount of feed to give laying hens. A plan which has been very satisfactory with the station flock is to feed one pint of wheat to each pen of 20 hens in the morning and one pint of oats with all the corn on the cob they will eat for the evening feed. At noon they are given all the mash which they will eat up clean. As the grain is measured out to them and the amount is therefore somewhat arbitrary, the birds are allowed to eat up all they want of the mash. The mash thus acts as a sort of a regulator on the appetite of the birds. The fowls are forced to scratch for the grain feeds thus giving them the needed exercise which is conducive to an active vigorous existence. Good judgment on the part of the feeder must be used at all times.

(Continued in November issue.)



One of the Best Poultry Farms in the State. The Envilla, of Cogswell.

frame curtain will prevent trouble of this sort and on the Station poultry plant we have found this a splendid adjunct to our system of ventilation. Either muslin, burlap or ducking may be used for this purpose. Windows are arranged in pairs, two windows to each pen, and the cloth frame is placed on each alternate window. Some of the sunlight has been shut off but it has given better ventilation and a house free from dampness and disagreeable odors. Of these three factors which the poultryman must to a certain extent control, viz., Light, Temperature and Ventilation, the problem of fresh air is the most vexing. The use of cloth curtains and an intelligent management of the windows is the best solution yet offered.

#### Feeding Laying Hens

There are three general classes of foods which fowls should have if the best results are to be obtained. These are 1st, Grain feeds; 2nd, Animal Food, and 3rd, Green Food.

Grain Feeds. All of the well known cereals with the possible exception of flax make good feeds for poultry. Wheat is probably the best single grain

we have just mentioned but when ground makes a good food for all classes of poultry.

Animal Foods. All fowls crave animal food of some sort and it must be used to supplement the grain ration if good results are to be expected. There are several forms in which this may be supplied. The commercial article called beef scraps and green cut bone are in most common use. While green cut bone is probably superior to beef scraps as far as actual feeding value is concerned, yet the difficulty of securing it, the labor involved in cutting the bone and the fact that it spoils easily does not make it a very satisfactory feed. Skim milk is an excellent protein food and can be fed with profit. Kitchen scraps are also a good source of animal food and should be saved and fed to the hens. The average flock of laying hens is fed too little animal food and while it may seem an expensive policy to purchase the commercial article yet it will pay in dollars and cents, if used in a judicious manner.

Green Foods. Under ordinary farm conditions hens lay best during the spring months when they have free

## Don't Sell Your Eggs

When they are cheap pack them with my new method—will keep two years—will be as fresh as new laid eggs. No special place required to store them. Cost only 1/2c per dozen to pack them. Write me for circular.

MRS. B. F. WILCOXON,  
Ft. Des Moines, Ia. Box 50.

ROSE COMB WHITE LEGHORN EGGS  
15 for \$1; 30 for \$1.50; 100 for \$4. Circular.  
M. F. Horning, - - - Alden, Minn



## AMONG OUR ADVERTISERS.

### POTATOES WANTED

Magill & Co., Fargo, N. D. wish to buy Early Ohio Potatoes in car loads or less. Be sure and see them or write them before selling.

They also want any nice grain that can be used for seed. Will pay extra price. Send along samples and get price.

### "A KALAMAZOO DIRECT-TO-YOU"

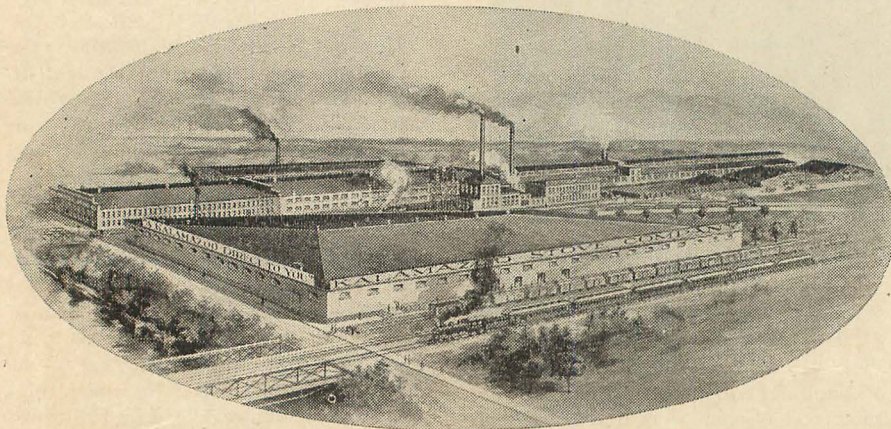
#### What That Means to Stove Buyers

Probably no phrase ever used in advertising is more widely known the phrase, "A Kalamazoo Direct-to-You." You doubtless have seen it hundreds of times, but unless you were contemplating buying a stove or range at the time, you may not have stopped to think what it really means to you.

A great number of our readers are certain to buy a stove or range of some

tered all over the United States have taken advantage of this offer and have saved all the way from \$5 to \$35 on every purchase which they made.

The Kalamazoo Stove Company lay great stress upon the fact that they are actual manufacturers. We print elsewhere on this page an illustration giving a bird's-eye view of their great plant in which every branch of stove making is carried on the year round. It has more than five acres of floor space well equipped with the most modern facilities for producing high-grade stoves and ranges and filled with the most carefully selected and most skilled stove makers in the country. Every Kalamazoo stove and range has back of it 35 years' experience in stove making and is given the most strict inspection before it is crated for shipment. The company must do this not only because they want to maintain the reputation of the Kalamazoo stove but also because they sell on 360 days' approval.



kind this season. If you are among this number, we believe that you are enterprising enough and economical to want to get the best stove or range that you can buy for the least money. If you can save a few dollars by buying direct from the manufacturer and at the same time be sure of getting a stove or range of first class quality, we know you want to do it.

You know that the dealer and the wholesaler must necessarily have to have a profit when they sell a stove or range, and this profit must be added to the factory price before the stove or range reaches you. If you could step into the factory and buy it at the manufacturer's price, you know that a great saving would be effected. You may not be able to get to Kalamazoo and buy a stove in person, but you can send your order there and buy at factory prices just as safely as tho you visited the factory. More than 100,000 families scat-

We urge every one of our readers who is contemplating buying a stove or range to send for the Kalamazoo catalog and prices. We are sure you can find what you want in it. We know the prices quoted will save you much money and you can depend upon it that you will get fair and square treatment from this standard company. No stove has a higher or better reputation for quality than the Kalamazoo, and no stove company has built up a better reputation for fair treatment and honesty than has the Kalamazoo Stove Company. Investigate their offer before you buy elsewhere. It will pay you. A postal card or letter addressed to the Kalamazoo Stove Company, Kalamazoo, Michigan, asking for catalog No. 485, will bring you the book without charge.

### FARM HELP

Farmers thruout the entire country are fast beginning to realize the value of

the stationary engine in helping to do the heavy end of the farm work. The Detroit Engine Co. of Detroit, manufacture an engine of this type that uses alcohol, gasoline, naphtha, distillate, kerosene, etc., without change in equipment, and is built especially for running pumps, cream separators, churns, grist mills, corn shellers, sawing machinery, etc., etc. They will mail a catalog free to interested parties.

### DENATURED ALCOHOL

A new industry that will rival petroleum is that of producing denatured alcohol for light, heat and power. Local men will erect a plant in a community to manufacture denatured alcohol. 5,000 feet of natural gas will produce about 50 gallons of alcohol. 5 gallons of alcohol equals about one cord of hard wood in heating units or one and three-tenths tons of lump coal, besides having the advantage of being practically smokeless, free from dust, ash, odor or clinkers. Denatured alcohol is now being used by every navy in the world and by nearly every city in France and Germany, where one never sees overhanging a busy manufacturing city that black cloud of dusty coal smoke so noticeable in American cities, and which has become a persistent and offensive nuisance. There are no speculative features, no prospecting for an unknown.

The German farmer reaps and threshes by aid of his spirit engine. It does the hauling up to 20 horse-power for the towns. The large creameries run their churns with it; the German housewife attaches it to her laundry and it works the washing machine as well as the sewing machine afterwards. The small housekeeper puts two cents' worth of alcohol in her nickel plated self-heating flat iron and uses it over two hours without its losing heat. Alcohol cooks prepare the food in restaurants as well as at home. Burned in lamps of best construction, with a mantel of well known type, alcohol produces an incandescent light of intense power, hardly second to the electric light itself. Natural gas alcohol will be cheaper than kerosene has ever been, and that we may all have it to burn.

Denatured alcohol is a necessity in every community on land and sea. The automobiles and the navies of the world consume millions of barrels of it. The market awaits the product. The Continental Natural Gas Alcohol Co, whose advertisement appears elsewhere, are ready to negotiate with commercial associations or local individuals for this new manufacturing industry at your locality if near natural gas belt.



# Home Affairs

Katherine C. Neilson, Editor, Mayville, N. D.

October, 1908

## Boiled Cider

Cider for boiling must be perfectly fresh and sweet; put into a large preserving kettle and boil until reduced one-half. Skim while boiling; seal in bottles or jugs.

In New England where both sweet and sour apples were grown and stored in the cellar, toward spring they were picked over and made into sauce.

Both sweet and sour were used for boiled cider apple sauce. Many gallons were made and kept in a very cool place, stone jars being used.

First turn down an old plate or dish in the bottom of the kettle to keep the fruit from burning as it has to cook a long time (if all sweet apples).

Pare, quarter and core the apples. One quart of boiled cider to a peck of apples. After it has boiled an hour or two add 1 pint of molasses; if you have a few quinces, those give a nice flavor. Do not stir often as it will break the apples and you wish to keep them whole if possible. This will be a rich dark sauce and a particularly fine relish with roast pork. Cook it long and slowly.

Boiled Cider is a fine flavoring for mince meat. Many N. E. cooks think it indispensable.

## Cider Pear Sauce

Cooking pears may be preserved in boiled cider the same as sweet apples. A pint of sugar may be added to each quart of boiled cider if desired.

## Cider Apple Jelly

Make the same as plain apple jelly, but cover the apples with cider sweet from the press instead of water.

## Grape Juice

Pick over and wash the fruit, crush slightly, boil gently one-half hour, use a wooden spoon. Drain thru cheese cloth and press out all the juice. Put the juice in the preserving kettle, boil up and skim. Add sugar in the proportion of 1 gill of sugar to a quart of juice; boil five minutes, skim and put into sterilized bottles or jars.

For all fruits except currants, proceed the same as with grape juice.

Grape juice is healthful, a pleasant beverage with a fish dinner, and good with all meats.

## Apple Jam (which will keep for years)

Weigh equal quantities of brown sugar and good sour apples.

Pare, core and chop the apples quite fine. Make a syrup of the sugar and clarify it; then add the apples, the grated peel of two or three lemons and some white ginger. Boil until the apple

looks clear and yellow. This resembles foreign sweet meats. The ginger is essential to its peculiar excellence. Pumpkin treated the same is as good as apples.

If your supply of currant jelly was scant this season—remember cranberries and apples half and half will make a fine substitute.

In this cold climate keen appetites crave fats and hot soups. With plenty of acids and apples our diet is beneficial for our needs.

The season of fried chickens, roast ducks, baked beans and New England vegetable dinners should recompense the "plow-boy" as he "homeward wends his weary way." Harvest-home rewards are truly a festival of the season.

## SPREADING TYPHOID FEVER

### Bacillus Carriers

Health officers in investigating the cause of typhoid fever have a new problem to consider, in the chronic bacillus carrier, which has hitherto been unrecognized and which it is well to bear in mind.

It has become known, chiefly thru the studies of some German investigators, that the typhoid fever bacillus may persist in the human body for some time

after an attack of typhoid fever. Cases have been reported where the patients have been carriers of the disease for years without suffering any inconvenience themselves. Kutscher thinks that about four per cent of typhoid patients become chronic carriers of the specific bacilli which they excrete in both urine and faeces for long periods, and cases have been cited in which the specific bacilli were isolated from the gall bladder seventeen and even twenty years after recovery. Apparently healthy people have been found, who have never had typhoid fever, but yet are the carriers of bacilli, which may be given off from time to time to infect susceptible persons—this tolerance being possibly acquired by repeated invasions of attenuated or mild bacilli. All members of a family may acquire this tolerance, if their water supply is affected, and be carriers, while a visitor not being immune may acquire the disease.

Soper of New York reports a case which has been described in the public press as a "typhoid factory." This was a woman who had had typhoid fever about six years prior to her discovery. Since that time she had worked as a cook in several families, and twenty-eight cases of typhoid occurred in the families in which she worked. The evidence against her seemed so strong that she was forcibly removed to a hospital, where an examination of her urine and faeces confirmed the suspicion that she was a typhoid carrier.—Bulletin Connecticut State Board of Health.

## Don't Buy a Stove or Range Until You First See How Much You Save By Getting

**"A Kalamazoo Direct to You"**

TRADE MARK REGISTERED

**YOU** want to make every cent you spend this year, **count for quality and economy.**

If you need a stove or range, don't buy until you get our **factory prices.** I promise you that I will save you \$5, \$6 or \$10 on our smallest stoves, and as high as \$18, \$20 and even \$30 on our largest. And I promise you that you cannot get **anywhere at any price,** a better stove or range than the Kalamazoo.

Just let me quote you prices. Take our catalogue and **compare** the Kalamazoo quality and prices, with the best line of stoves and ranges you can find sold at retail. **That** will tell the story. You can see for yourself. You want to save money and you want to get high quality. Why not investigate our plan, then? Why not let me show you the difference between manufacturers' prices and retail prices on stoves or ranges?

We sell to you, direct from the factory, at actual factory prices.

## On 360 Days Approval Test—We Pay the Freight



I promise, in black and white, to refund your money—every cent of it—if you do not find your purchase in every way exactly as represented.

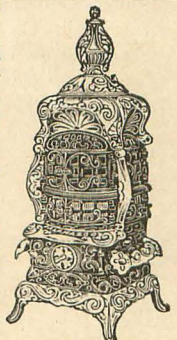
Remember, every Kalamazoo is of the highest possible grade, made of the best materials and in the best manner. You deal directly with the manufacturers—a company that has a larger number of individual customers than any other stove company in existence. We have sold thousands of stoves and ranges to readers of this journal, and no doubt can refer you to near neighbors who have saved money by buying a Kalamazoo. Many customers write that they have saved enough on a single Kalamazoo to pay for a whole season's fuel. You can save enough to buy a new suit, a new dress, an article of furniture, or perhaps to pay your taxes. Is it not to your interest to get our prices?

## Send Postal for Catalogue No. 195

describing more than 300 sizes and styles of Coal and Wood Ranges, Coal and Wood Heaters, Hotel Ranges, Base Burners, Laundry Stoves, Etc.

I know that if you get our prices—and see our quality you will not even think of buying any other make. Let me show you how much you can save.

**William Thompson, Vice-Pres. & Gen. Mgr.**  
**KALAMAZOO STOVE CO., Mfrs. Kalamazoo, Mich.**



All Kalamazoo cook stoves and ranges have patent thermometers which make baking and roasting easy.



## Shade Trees and Gardens.

C. B. Waldron, N. D. A. C., Editor.

The past year has been, on the whole, a very unfavorable one for tree growth. The warm winter of 1908-07 killed many of the young trees outright, and left the others in a very weakened condition, so that they did not assume their foliage until the season was well advanced. It was noticed from the start that some species of trees endured this condition much better than others. In addition to the trying conditions just named should be added that of a dry hot summer which came not long after a good many of the trees had made an attempt to renew their normal activities. This hot weather was especially trying to cottonwoods, hundreds of which died outright.

The trees which seemed to succeed best were the ash and the willow, particularly the older trees of these species. Long after the cotton-woods and many of the box elders had succumbed to the dry hot weather the ash and willow were still holding their foliage in good shape, and in most places are even to this day.

I think there can be no question but that the willow, either the gray willow, called also white willow, or the golden Russian willow, will be found the most suitable tree for general planting in North Dakota. The Russian willow is undoubtedly the most satisfactory wind-break, but the gray willow seems to have a more upright growth, making it suitable for wood and posts.

Among the common growing trees that were planted some twenty years ago the willows are about the only ones that have a real value at the present time. Some of these groves recently examined, that have been growing twenty years, would cut in the neighborhood of seventy-five cords of wood per acre. The trees are also rather tall and straight, making them suitable for posts.

While the common willow does not make a very valuable post yet when peeled and seasoned it will last a good many years. The white willow, when seasoned, has high fuel value for soft wood. One of the great advantages of the willow is that it never needs replanting, new sprouts spring up quickly and vigorously from the old stumps.

Where timber of a higher value than the willow is required the ash seems to be by far the most suitable tree. In the Eastern half of the state the white ash succeeds very well, but in the Western half of the state the native ash, or green ash, as it is called, is the most reliable. Where the white ash thrives it makes the

more rapid growth and is the larger tree.

The box elder seems to be about the most valueless of all trees for timber purposes. I have been unable to find a single box elder grove in the state that has any value aside from the shelter which it furnishes. They would, of course, make some fuel, but the cost of cutting it would almost equal the value of the fuel. Moreover the second growth from box elders is never satisfactory. I would not plant box elders except for nurse trees in getting ash and other trees started, and for shade trees about the house.

The cotton-wood presents greater possibilities as a timber tree, but the repeated failures of cotton groves after they reach an age of fifteen years should make a man carefully consider the conditions before planting cotton-woods. There are of course, a number of good cotton-wood groves in North Dakota. These are grown upon soil that is very retentive of moisture, or that has a water supply only a few feet from the surface. Where one finds one of these groves there are many that have made but little growth for the first few years, and many more that are dying outright at the time when they should be making their best progress.

Generally speaking we would not recommend the planting of cotton-woods except under the conditions that we have named, or as a single row of trees. Even under these conditions willow will be of far greater value at the end of twenty years than cotton-wood. The single row of trees is of no particular value aside from a matter of appearance.

It answers no purpose as a wind break, and as is well known the cotton-woods do not furnish much shade.

In place of this single row of cotton-wood trees shelter belts consisting of willows on the outside and re-inforced by two or three rows of ash would make a far more useful and durable shelter.

While it would not be safe to recommend this tree for general planting on a large scale, still among other trees, particularly the ash, it makes a very satisfactory growth.

C. B. W.

### ARSENICAL POISONING OF FRUIT TREES

It has been a mooted question for some time as to whether the use of arsenical poisons on fruit trees would result in the accumulation of sufficient poison in the ground to in any way interfere with the growth of trees or other forms of plant life, in as much as practically all of the material that is used in arsenical poison ultimately finds its way into the soil. It is well known that where trees are being sprayed there must be a considerable accumulation of arsenate in the ground.

Dr. Hadden of Colorado has been making some observations and study, and he concludes that in many cases the trees are suffering at the present time from systemic arsenical poisoning, lime poisoning, or both. He also points out that the accumulation of lime salts or alkali salts in the soil tends to promote the poisonous activity of the arsenic accumulated in the soil. Also, that the systemic poisoning may take place by the absorption of the arsenic by the nutritive salts taken up by the feeding roots.

This raises an important question as to how long and to what extent arsenic salts may be safely used as a spray upon any form of plant life without producing

## SALESMEN WANTED

Reliable, energetic men, to sell our hardy Northern grown nursery stock throughout the Northwest; a good income for good workers; send for terms.

THE ANDREWS NURSERY, Dept. C.,

FAIRBAULT, MINN.

## SEED WANTED

We wish to buy anything in choice  
Wheat, Oats, Barley, Speltz, Rye, Flax, Corn, Millet,  
Timothy, Clover, Bromus, Buckwheat,  
Peas, Beans, Etc.

FARGO SEED HOUSE, - - - Fargo, N. D.



injury, and whether the arsenic would be taken up in the vegetable products so as to make them injurious to the health of man. We have known gardeners to use arsenic salts such as paris-green for spraying or sprinkling upon cabbage-heads, a most dangerous practice, for any one who eats of the cabbage must be ultimately taking into their system a quantity of arsenic, even tho it might be in too minute a quantity to act as immediate poisoning.

#### SOIL HUMUS

There has just recently been issued from New Hampshire a most important and interesting bulletin, entitled "Humus in New Hampshire Farms," that can be read with profit by every farmer in all parts of the U. S. It deals with the subject in a broad way, shows the amount of humus in the soil, to some extent how it acts as a store-house, how it is reduced by systems of cropping methods for the conservation of humus, and

the rapid construction of humus by other methods of tillage.

As stated, the effects on the soil are both physical and chemical; it not only lightens the texture of the soil, but increases the absorption powers of the water and plant food dissolved in it.

The formation of lime, iron and other compounds of the humus serve as strong cementing agents and so improve the structure of the soils rendering them more friable.

The chemical effects are equally important. By slow decaying of the humus there is liberated nitrogen, and phosphorous and potassium are made available for plant growth. As the humus disappears the phosphate and potash salts are changed into insoluble compounds, thus rendering the soils less productive, and the nitrates formed are leached by drainage waters from the land.

Our readers should send to the Experiment Station at Durham, N. H. for a copy of this valuable bulletin.

## OILS, PAINTS, AND PAINT PIGMENTS.

It does not pay to neglect painting buildings old or new. Paint properly applied is the great protector and beautifier of our homes, our shops and farm buildings. Without paint a place rapidly goes down hill to ruin. A little paint protects and beautifies at the same time.

As one drives thru the country, if he sees farm buildings without paint, he has no desire to settle in this community for he recognizes that he is among a shiftless people. On the other hand when he finds a community with well painted buildings and out houses, he knows that there is intelligence and culture in the community.

Let us learn to use good paint freely, but not wastefully in North Dakota. Paint is a good investment when properly used.

A little paint experience may be of interest to you. A recently constructed building was to be painted. It had stood for a full month and the siding seemed dry and in good condition to receive paint. The paint was applied, two coats; the east, south and west sides were all right. The North side looked well but the sun did not reach this. The building was sealed with lumber, a hall, steam heated. When cold weather came the steam was turned on and trouble began. There was moisture in that lumber down deep, not on the surface; the heat drove it back beneath the film of paint. The paint held, the moisture could not escape and the paint was forced from the wood in "blotches" and

here and there stain appeared on the surface of the paint resembling tobacco juice. In the spring, the paint could be pulled off in strips ten feet in length, strong and elastic. No fault of the paint, but moisture in the wood that must escape and the film of paint would not let it pass and so the paint and wood parted company. Here we have a lesson. The better the paint the worse the result if there is moisture beneath the paint. We shall have something more to say on this point.

Sept. 26th, 1908.

The North Dakota Experiment Station has in press bulletin No. 81 dealing with the practical tests of paints as made at the Station during the past two years. It includes the painting tests made with paints furnished by the Paint Manufacturers' Association, various white leads and combination white leads, and gives the results of experiments at the end of the first year's tests.

This bulletin will be ready for distribution about Oct. 30th, and will be sent to those who make application for copies of the same.

E. F. LADD, Com.

#### THE A B C OF HOUSE PAINT

Dr. L. S. Hughes

The business of paint making is very far from being the simple matter of mixing a powder of the desired color with an oil which will "dry," that most people, when they think about it at all, imagine

it to be. On the contrary, no art involves more delicate chemical considerations.

The simplest of all its problems, that of grinding, is itself no easy matter, for the oil must be so thoroly incorporated with the pigments that it shall surround each particle separately. This cannot be done by a simple mixing, and it requires special skill when, for instance, the sublimed pigments, the grains of which have diameters ranging from 1-30,000 to 1-50,000 of an inch in diameter, are employed. With such fineness, the oil does not naturally separate the groups of pigment particles and they have to be rubbed apart by prolonged mashing and friction in the presence of the oil. And this must be effected without allowing any great amount of heat to develop during grinding.

In the selection of pigments to be used together, every effort must be made to combine only those pigments which are chemically indifferent toward each other, and, as nearly as possible, toward the linseed oil. Neglect of this precaution is responsible for perhaps more paint failures than all other causes combined. In the preparation of tinted paints also, the failure to secure chemical harmony among the ingredients is a fruitful source of trouble. Fading or loss of tone may not be in reality so serious a fault as peeling, checking or washing, but it is sufficiently annoying.

Thoro grinding, protection of the oil by reduction of the amount of chemically active pigments, and proper consideration of the chemical attraction existing between the pigments would seem to furnish enough problems for the paint maker, but they are not all. It is becoming recognized by an increasing majority of investigators that the structure of the paint film is a factor which cannot be ignored and that proper structure can only be obtained by mixing together pigments of differing fineness; amorphous with crystalline materials, and sharp-angled crystals with those of tabular shape. Very much the same influences appear to act here as are found in the mixing of concrete, where the best results are obtained by adding to the pure cement large amounts of sand and broken stone. On this point it is argued that a mixture of three sizes gives the closest-grained structure obtainable. Many makers of good paints have long employed such a mixture without regard to theoretical considerations, having found from experiment that the formula gave good service. In fact, it is only recently that, with wider and more painstaking use of the microscope, the functions of different sizes and shapes of the pigment particles have been recognized.

The liquids used in paint are subject of no less importance than the pigments,



but because no satisfactory substitute has yet been discovered for linseed oil their selection is not so complicated a puzzle.

Linseed oil is one of the heavier "fixed" oils; that is, it cannot be distilled. It differs from all animal oils and from most of the other vegetable oils in its power of absorbing oxygen from the air and gradually changing to a solid during the process. This is the so-called "drying." By the addition of oxygen the oil increases in weight until when completely hardened it has added about sixteen per cent to its original weight.

All efforts to substitute for linseed oil various solutions of a solid in volatile liquids which would evaporate and leave the solid as a resinous layer have so far resulted unsatisfactorily.

"Boiled linseed oil," when it is the genuine article, is linseed oil which has been partially oxidized by heating in an open kettle and to which metallic oxides, usually those of lead and manganese, have been added. The purpose for which these oxides are added is to furnish carriers of oxygen and thus hasten its absorption by the oil. Because of their presence and also because it is partially oxidized, boiled linseed oil dries in much less time than raw oil.

Unfortunately a large porportion of the "boiled" linseed oil on the market is of what is known as the "bung-hole" kind; that is, it has not been heated in a kettle, but the drying property has been obtained by mixing with raw oil large amounts of powerful driers containing the necessary metallic oxides. Much of this imitation boiled oil is adulterated with rosin or fish oil, and it is in all cases inferior to the genuine kettle-boiled oil.

The use of boiled oil is gradually diminishing for outside work, because of recognition that raw oil is at least equally durable and is much less liable to be adulterated than the boiled oil. This comparative freedom from sophistication has been forced by improved methods of testing oils, which now render it possible for a chemist to decide positively whether raw linseed oil is pure or not. With boiled oil it is frequently impossible to come to a definite conclusion, because the material is necessarily variable in character, no two lots of oil, even from the same factory being exactly alike.

Even in the case of raw oil the matter of testing is one requiring long experience. It is true that many tests have been devised and exploited as determining the purity of linseed oil, such as shaking with nitric acid, watching the rate at which the bubbles break in a tube and even tasting the oil. Each one of these and a number of other simple methods do give indications of the

presence or absence of one or two adulterants in the oil, but no certainty can be assumed for these indications unless they are confirmed by determination of the specific gravity and other laboratory operations which the purchaser, in the great majority of cases, cannot well perform himself. Then, too, the purity of linseed oil is not a sufficient proof that it will give good results in painting. It may be pure and still have become rancid; or, if bleached oil, it is quite likely to have been so affected by the bleaching process as to contain a ruinous amount of free fatty acid. Either of these faults is quite as serious from the point of usefulness as adulteration.

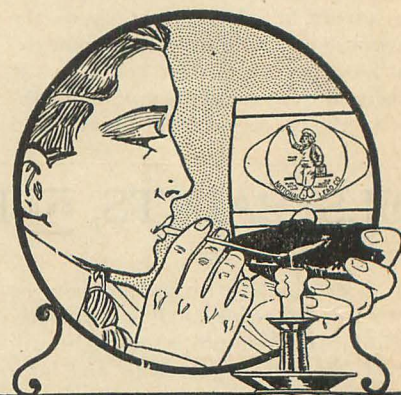
Fortunately, the quality of raw oil on the market has been considerably improved during the past few years, tho it is probably not so good as the old-fashioned "cold-pressed" oil.

The nature of the dried coats of both raw and boiled linseed oil is very much the same as regards exclusion of gases and moisture. Neither is a good protective coating in itself, because both have the property of absorbing water and gases from the air. This action of the oil film is generally accounted for by assuming a porous character for the film and, altho this explanation is not correct as a matter of fact, it nevertheless gives a fairly good idea of what happens.

This property of allowing gases and liquids to pass thru is by no means an unmixed evil. It is excessive in the case of the oil itself, but when the oil is distributed thru a mass of exceedingly fine pigment particles it is much diminished. Some such action is necessary to allow the escape of moisture contained in the material painted. If the coating were so close as to confine this moisture the former could not resist the expanding influence of the moisture when it evaporated and the paint would be lifted off the surface. This action is sometimes seen in the case of peeled or blistered paints. In some instances this has not been due to any fault of the paint, but to the fact that the surface had been painted when there was an undue amount of moisture beneath it which was suddenly evaporated by the sun. Some pigments have the property of making the coat almost impassable to water vapor and, if they are used in too large a proportion, give the paint a bad reputation as likely to peel. Particularly is this the case in those parts of the country where the humidity and temperature of the air are subject to abrupt changes.

Peeling is not always due to moisture. Too large a percentage of chemically active materials in the mix will cause this, and sometimes it is caused by too frequent painting. If a surface is painted at such short intervals that the old coats

have not had time to wear away the paint is built up to such a thickness that it can no longer expand and contract with the surface and consequently tears loose from it. Indeed the causes of paint failures are very numerous: Peeling, chalking, checking, "alligating," blistering and discoloration could each be made the text for a long discussion, but their detailed consideration is somewhat beyond the scope of this article, which is no more than a brief outline of some of the most salient difficulties in the preparation of paint. Extended discussion of some phases of special interest to the painter and dealer must be deferred to future issues of the American Paint and Oil Dealer.—American Paint and Oil Dealer.



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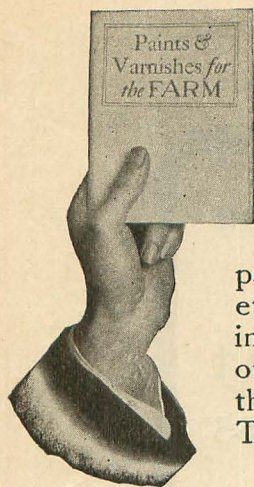
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